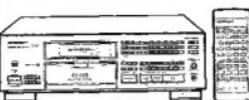


# Service Manual



ORDER NO.  
ARP2228

COMPACT DISC PLAYER

# PD-31

PD-8700  
PD-7700

PD-8700-S  
PD-7700-S

PD-31, PD-8700, PD-8700-S, PD-7700 AND PD-7700-S HAVE THE FOLLOWING :

Type	Model					Power Requirement	Remarks
	PD-31	PD-8700	PD-8700-S	PD-7700	PD-7700-S		
KU	○	—	—	○	—	AC120V only	
KC	—	—	—	○	—	AC120V only	
HEM	—	○	—	○	—	AC220-230V, AC230-240V(swivable)*	
HB	—	○	—	○	—	AC220-230V, AC230-240V(swivable)*	
SD	—	○	—	○	—	AC110V, 120-127V, 220V, 240V(swivable)	
HEWM	—	—	○	—	○	AC220-230V, AC230-240V(swivable)*	
HPW	—	—	—	○	—	AC220-230V, AC230-240V(swivable)*	

\* : Change the primary wiring of the power transformer.

- This manual is applicable to the PD-31/KU, PD-8700/HEM, HB, SD, PD-8700-S/HEWM, PD-7700/KU, KC, HEM, HB, SD, HPW and PD-7700-S/HEWM types.
- As to the PD-8700/HEM, HB, SD AND PD-8700-S/HEWM types, refer to page 81.
- As to the PD-7700/KU, KC, HEM, HB, SD, HPW and PD-7700-S/HEWM types, refer to page 83.
- Ce manuel pour le service comprend les explications de réglage en français.
- Este manual de servicio trata del método ajuste escrito en español.

## CONTENTS

1. SAFETY INFORMATION	2	6. AJUSTE	65
2. EXPLODED VIEWS AND PARTS LIST	4	7. FL INFORMATION	80
3. P.C.B's PARTS LIST	11	8. FOR PD-8700/HEM, HB, SD AND	
4. PACKING	14	PD-8700-S/HEWM TYPES	81
5. SCHEMATIC DIAGRAM AND P.C.BOARDS		9. FOR PD-7700/KU, KC, HEM, HB, SD, HPW AND	
CONNECTION DIAGRAM	15	PD-7700-S/HEWM TYPES	83
6. ADJUSTMENTS	35	10. PANEL FACILITIES	101
6. RÉGLAGE	50	11. SPECIFICATIONS	103

PIONEER ELECTRONIC CORPORATION 4-1, Meguro 1-Chome, Meguro-ku, Tokyo 153, Japan

PIONEER ELECTRONICS SERVICE INC. P.O. Box 1760, Long Beach, California 90801 U.S.A.

PIONEER ELECTRONICS OF CANADA, INC. 505 Cochran Drive, Markham, Ontario L3R 8E3 Canada

PIONEER ELECTRONIC [EUROPE] N.V. Keetberglaan 1, 9120 Beveren, Belgium

PIONEER ELECTRONICS AUSTRALIA PTY. LTD. 178-184 Boundary Road, Braeside, Victoria 3195, Australia TEL: (03) 580-9911

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F1 APR. 1991 Printed in Japan

This service manual is intended for qualified service technicians; it is not meant for the casual do-it-yourselfer. Qualified technicians have the necessary test equipment and tools, and have been trained to properly and safely repair complex products such as those covered by this manual.

Improperly performed repairs can adversely affect the safety and reliability of the product and may void the warranty. If you are not qualified to perform the repair of this product properly and safely, you should not risk trying to do so and refer the repair to a qualified service technician.

#### **WARNING**

Lead in solder used in this product is listed by the California Health and Welfare agency as a known reproductive toxicant which may cause birth defects or other reproductive harm (California Health & Safety Code, Section 25249.5).

When servicing or handling circuit boards and other components which contain lead in solder, avoid unprotected skin contact with the solder. Also, when soldering do not inhale any smoke or fumes produced.

## **1. SAFETY INFORMATION**

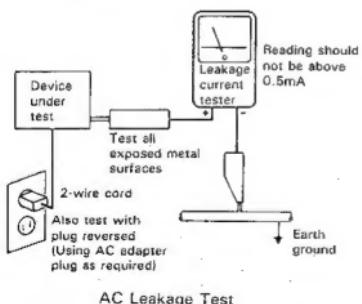
(FOR USA MODEL ONLY)

### **1. SAFETY PRECAUTIONS**

The following check should be performed for the continued protection of the customer and service technician.

#### **LEAKAGE CURRENT CHECK**

Measure leakage current to a known earth ground (water pipe, conduit, etc.) by connecting a leakage current tester such as Simpson Model 229-2 or equivalent between the earth ground and all exposed metal parts of the appliance (input/output terminals, screwsheads, metal overlays, control shaft, etc.). Plug the AC line cord of the appliance directly into a 120V AC 60Hz outlet and turn the AC power switch on. Any current measured must not exceed 0.5mA.



ANY MEASUREMENTS NOT WITHIN THE LIMITS OUTLINED ABOVE ARE INDICATIVE OF A POTENTIAL SHOCK HAZARD AND MUST BE CORRECTED BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

### **2. PRODUCT SAFETY NOTICE**

Many electrical and mechanical parts in the appliance have special safety related characteristics. These are often not evident from visual inspection nor the protection afforded by them necessarily can be obtained by using replacement components rated for voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this Service Manual.

Electrical components having such features are identified by marking with a  $\Delta$  on the schematics and on the parts list in this Service Manual. The use of a substitute replacement component which does not have the same safety characteristics as the PIONEER recommended replacement one, shown in the parts list in this Service Manual, may create shock, fire, or other hazards.

Product Safety is continuously under review and new instructions are issued from time to time. For the latest information, always consult the current PIONEER Service Manual. A subscription to, or additional copies of, PIONEER Service Manual may be obtained at a nominal charge from PIONEER.

(FOR EUROPEAN MODEL ONLY)

**VARO!**

AVATTAESSA JA SUOJALUKITUS OHITETTAESSA OLET ALTINNA NAKYMATOMALLE LASERSÄTEILYLLÉ. ALÄ KATSO SÄTEESEEN.



LASER  
Kuva 1  
Lasersäteilyn varoitusmerkki

**WARNING!**

DEVICE INCLUDES LASER DIODE WHICH EMITS INVISIBLE INFRARED RADIATION WHICH IS DANGEROUS TO EYES. THERE IS A WARNING SIGN ACCORDING TO PICTURE 1 INSIDE THE DEVICE CLOSE TO THE LASER DIODE.



LASER  
Picture 1  
Warning sign for laser radiation

**ADVERSEL:**

USYNLIG LASERSTRÅLING VED ABNING NÄR SIKKERHEDSAFTRYDRE ER UDE AF FUNKTION UNDGÅ UDSAETTELSE FOR STRÅLING.

**IMPORTANT**

THIS PIONEER APPARATUS CONTAINS LASER OF HIGHER CLASS THAN 1. SERVICING OPERATION OF THE APPARATUS SHOULD BE DONE BY A SPECIALLY INSTRUCTED PERSON.

**VARNING!**

OSYNLIG LASERSTRÅLING NÄR DENNA DEL ÄR ÖPPNAD OCH SPÄRREN ÄR URKOPPLAD. BETRAKTA EJ STRÅLEN.

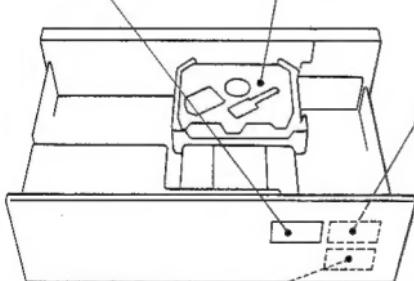
**LASER DIODE CHARACTERISTICS**  
MAXIMUM OUTPUT POWER: 5 mW  
WAVELENGTH: 780-785 nm

**LABEL CHECK**

**HB,HEM and HEWM types**

**CLASS 1  
LASER PRODUCT**

PRW1-228



**HEM and HEWM types**

**VARO!**

AVATTAESSA JA SUOJALUKITUS OHITETTAESSA OLET ALTINNA NAKYMATOMALLE LASERSÄTEILYLLÉ. ALÄ KATSO SÄTEESEEN.

**VARNING!**

Öppnas laserdäcket när denna del är öppnad och spärren är urkopplad. Betrakta ej strålen.

PRW1-228

**Additional Laser Caution**

**1. Laser Interlock Mechanism**

The ON/OFF (ON : low level, OFF : high level) status of the LPS1 (S601) and LPS2 (S602) switches for detecting the loading state is detected by the system microprocessor, and the design prevents laser diode oscillation when both switches LPS1 and LPS2 are not ON (low level)(clamped state). Thus, interlock will no longer function if switches LPS1 (S601) and LPS2 (S602) are deliberately shorted.

Also, in the test mode\*, the interlock mechanism does not operate too. Laser diode oscillation will continue if pins 2 and 3 of CXA14715 (IC101) are connected to ground or pin 20 is connected to high level (ON) or the terminals of Q101 are shorted to each other (fault condition).

1. Laser Interlock Mechanism
2. When the cover is opened with the servo mechanism block removed to be turned over, close viewing of the objective lens with the naked eye will cause exposure to a Class 1 or higher laser beam.

**ADVARSEL:**  
USYNLIG LASERSTRÅLING VED ABNING NÄR SIKKERHEDSAFTRYDRE ER UDE AF FUNKTION UNDGÅ UDSAETTELSE FOR STRÅLING.

**WAARSCHUWING:**

ONDERSTELLE LASER-STRAHLUNG WENN AUS. WENN DECKEL GEKLEPPT GEÖFFNET IST NIET DEM STRAHL AUSSETZEN.  
PRW1-004

**CAUTION**  
**INVISIBLE LASER  
RADIATION WHEN OPEN,  
AVOID EXPOSURE  
TO BEAM**  
PRW1018

**HEM and HEWM types**

**HB type**

\* Refer to page 36.

## 2. EXPLODED VIEWS AND PARTS LIST

### NOTES :

- Parts without part number cannot be supplied.
- Parts marked by "●" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.
- The ▲ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.

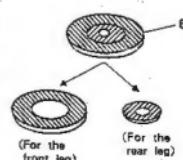
### 2.1 EXTERIOR

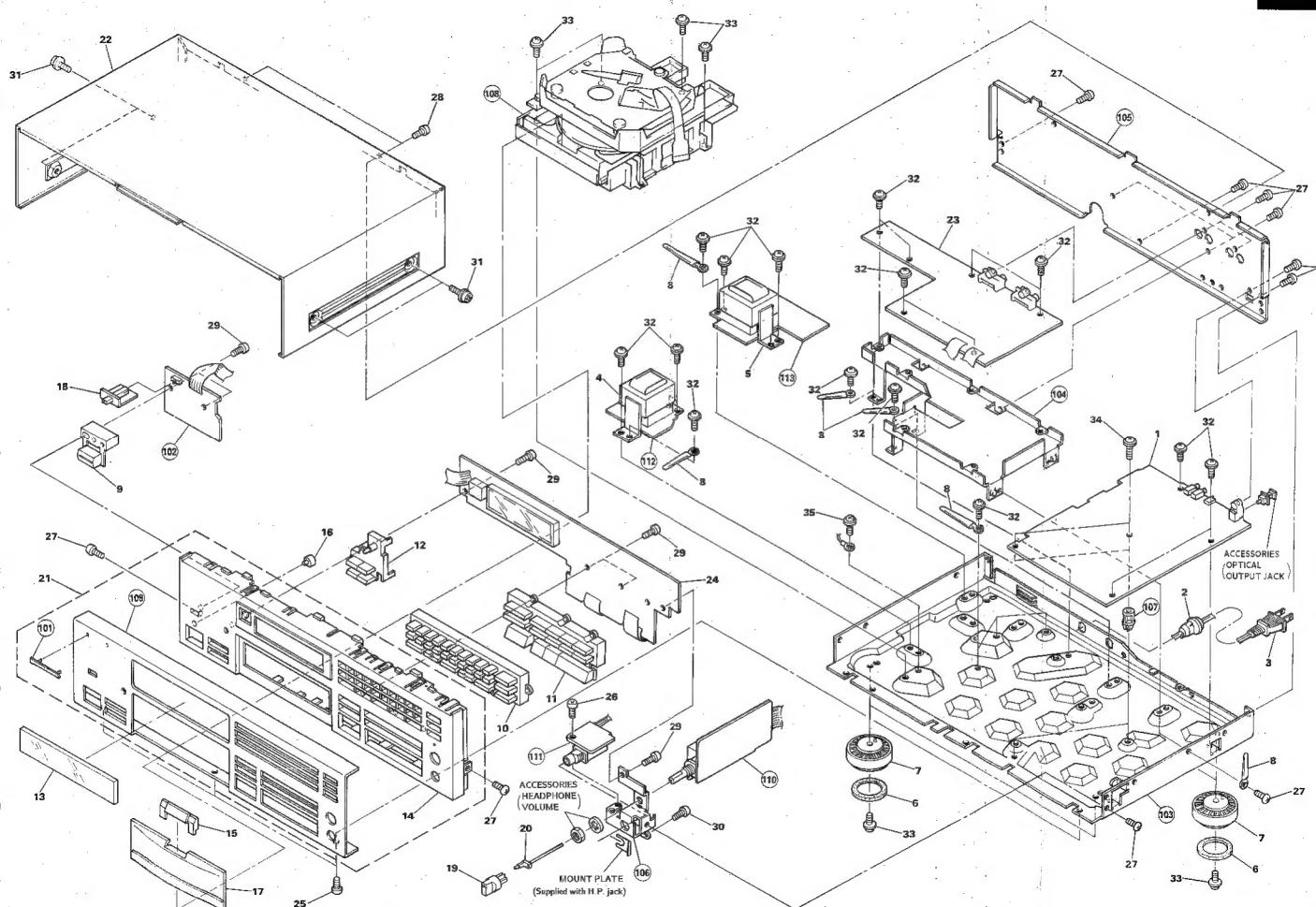
#### Parts List of Exterior

Mark No.	Description	Parts No.	Mark No.	Description	Parts No.
▲ ● 1	Mother board assembly	PWM1448	101	Name plate(ABS)	
▲ 2	Strain relief	CM-22C	102	SW board assembly	
▲ 3	AC power cord	PDG1015	103	Under base	
▲ 4	Power transformer S(AC120V)	PTT1179	104	Audio angle	
▲ 5	Power transformer A(AC120V)	PTT1183	105	Rear base	
6 Stopper	PNM1134	106	Headphone angle		
7 Insulator	PNW2020	107	Spacer		
8 Cord clamps	RNH-184	108	Loading mechanism assembly		
9 Power button	PAC1569	109	Front panel		
10 Select button	PAC1570	110	Headphone board assembly		
11 Play button	PAC1571	111	Jack board assembly		
12 Search button	PAC1572	112	S trans board assembly		
13 Search window	PAM1503	113	A trans board assembly		
14 Control panel	PNW1948				
15 Tray lens	PNW1950				
16 LED lens	PNW2019				
17 Tray panel	PNW2055				
18 Slide knob	RAC1428				
19 Knob C	RAC1608				
20 BIAS lens	RNK1674				
21 Front panel assembly	PEA1164				
22 Bonnet	PYY1148				
● 23 Audio board assembly	PWZ2118				
● 24 Operate board assembly	PWZ2112				
25 Screw	BZT30P080FZK				
26 Screw	BBZ30P060FMC				
27 Screw	BBZ30P080FCC				
28 Screw	BBZ30P080FCC				
29 Screw	BBZ30P120FMC				
30 Screw	BBZ30P120FMC				
31 Screw	PBT40P080FZK				
32 Screw	IBZ30P060FCC				
33 Screw	IBZ30P080FCC				
34 Screw	IBZ30P150FCC				
35 Screw	PDZ30P060FCC				

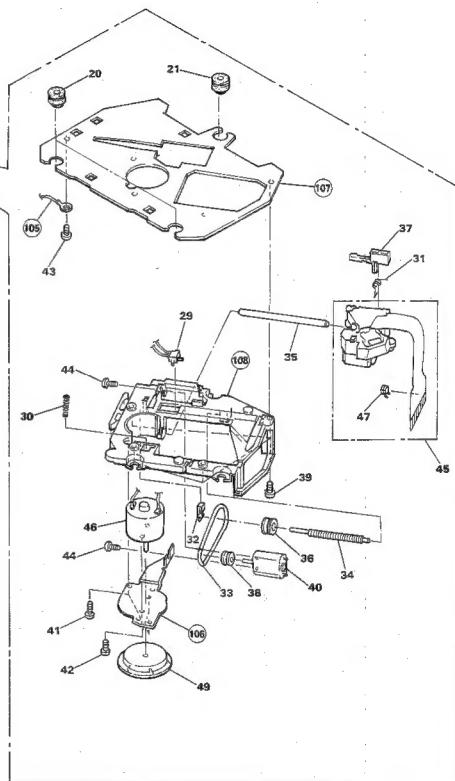
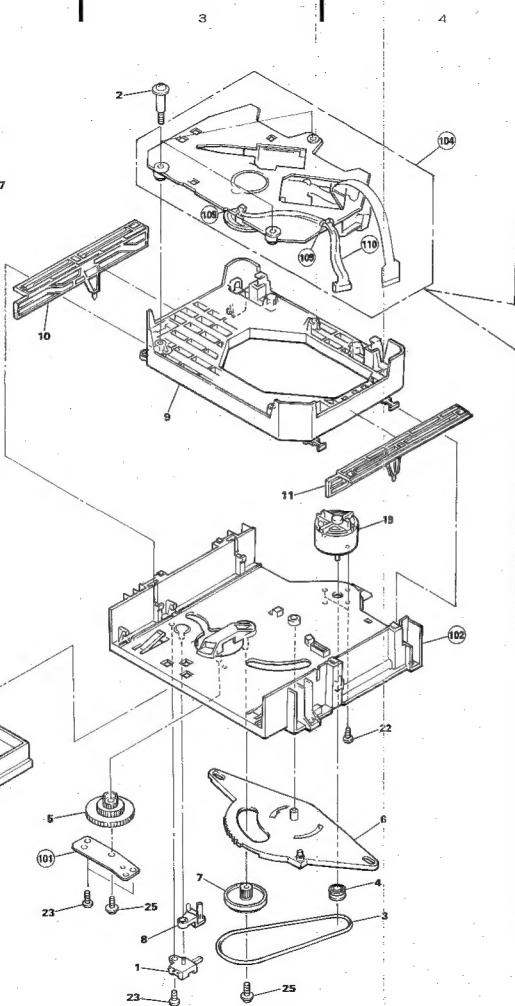
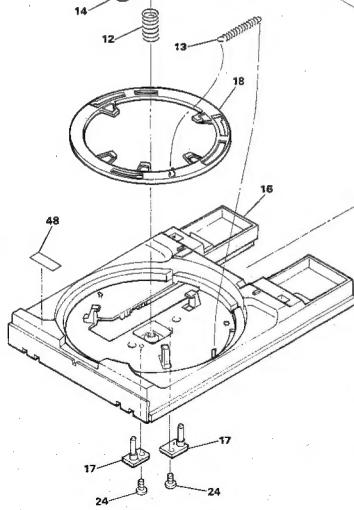
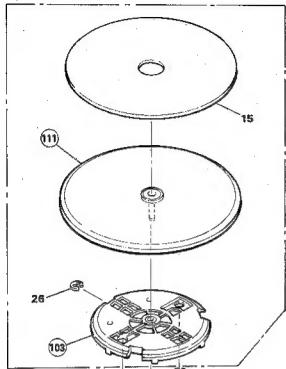
\* The stopper consist of the big ring part and the small ring part.

If you stick the stopper to the leg, stick the big ring part to the front leg, and the small ring part to the rear leg.





## 2.2 MECHANISM SECTION



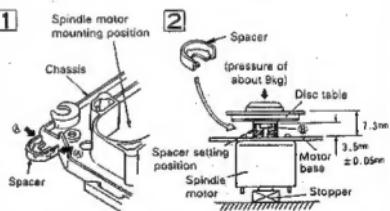
## Parts List of Mechanism section

Mark	No.	Description	Parts No.	Mark	No.	Description	Parts No.
1	Lever switch	DSK1003		101	Shaft holder		
2	Screw(steel)	PBA1027		102	Loading base		
3	Rubber belt	PEB11186		103	Table bearings assembly		
4	Motor pulley	PNW1634		104	Servo mechanism assembly		
5	Drive gear	PNW1996		105	Earth lead unit(300V)		
6	Timing lever	PNW1997		106	Motor base		
7	Gear pulley	PNW1998		107	Mechanism base		
8	SW head	PNW1999		108	Mechanism chassis		
9	Float base	PNW2000		109	Clamper		
10	Left cam	PNW2001		110	Connector assembly		
11	Right cam	PNW2002		111	Turn table(AL)		
12	Compression spring	PBB1120					
13	Tension spring	PBB1121					
14	Float(rubber)	PEB1014					
15	Table rubber sheet	PEB1181					
16	Tray	PNW2003					
17	Table guide	PNW2004					
18	Loc plate	PNW2005					
19	DC motor(0.75W)	PXM1010					
20	Rubber bush	PEB1031					
21	Rubber bush	PBB1170					
22	Screw	BMZ26P040FMC					
23	Screw	BPZ26P060FMC					
24	Screw	BPZ26P060FMC					
25	Screw	IPZ20P080FMC					
26	Stop ring	YE205					
27	Turn table assembly	PEA1165					
28	Push switch	DSG1014					
29	Spring	PBH1009					
31	Spring	PBH1084					
32	Plat spring	PBX1057					
33	Belt(square)	PEB1072					
34	Screw	PLA1003					
35	Guide bar	PLA1071					
36	Pulley	PNW1066					
37	Half nut	PNW1605					
38	Motor pulley	PNW1634					
39	Screw	PBZ30P080FMC					
40	DC motor(1.7W)	PXM1013					
41	Screw	BPZ20P080FZK					
42	Screw	JFZ20P025FMC					
43	Screw	PBZ30P060FMC					
44	Screw	PMZ20P030FMC					
45	Pick up assembly	PEA1030					
46	DC motor assembly(With oil)	PEA1156					
47	Semi-fixed VR(3.3K)	PCP1008					
48	Caution label	PRW1244					
49	Disc table	PNW1067					

### • How to install the disc table

[1] Use nippers or other tool to cut the two sections marked ① in figure [1]. Then remove the spacer.

[2] While supporting the spindle motor shaft with the stopper, put spacer on top of the motor base (angled so it doesn't touch section ②), and stick the disc table on top (takes about 9kg pressure). Take off the spacer.



### 2.3 REMOVE THE TRAY PANEL AND THE TRAY LENS

Hold the tray panel with your hands as the figure shown right, and grasp the tray with your thumbs and then lift the tray panel up while pulling it toward you with the other fingers. (Figs. 1 and 2)

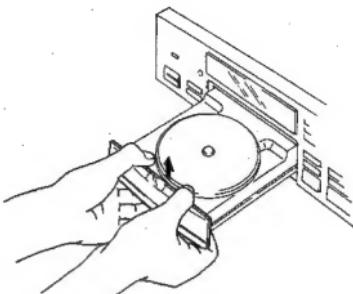


Fig. 1

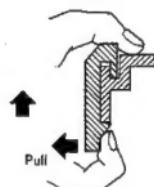


Fig. 2

### 2.4 INSTALL THE TRAY PANEL AND THE TRAY LENS

Align the tray panel with the grooves located at both edges of the tray while holding the tray lens with your fingers, and then press it down till it stops. (Fig. 3)

Hold the tray panel and the tray as shown in Fig. 4 and slide them down till you hear a click sound while pressing strongly with your thumbs. (Figs. 4 and 5)

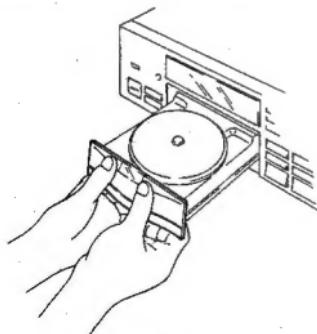


Fig. 4

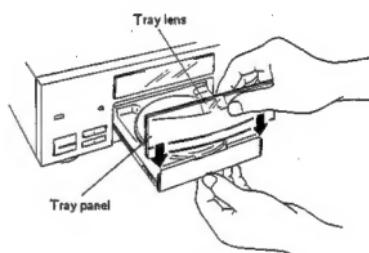


Fig. 3

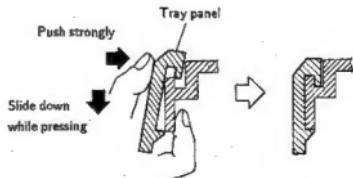


Fig. 5

### 3. P.C.B.'s PARTS LIST

#### NOTES :

- Parts without part number cannot be supplied.
- Parts marked by "●" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.
- The ▲ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- When ordering resistors, first convert resistance values into code form as shown in the following examples.

*Ex.1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5%, and K = 10%).*

560Ω 56 × 10<sup>2</sup> 561 ..... RD1/4PS[5][6][J]

47kΩ 47 × 10<sup>3</sup> 473 ..... RD1/4PS[4][7][J]

0.5Ω 0R5 ..... RD2H[0][R][5][K]

1Ω 010 ..... RD1P[0][1][0][K]

*Ex.2 When there are 3 effective digits (such as in high precision metal film resistors).*

5.62kΩ 562 × 10<sup>3</sup> 5621 ..... RD1/4SR[5][6][2][F]

Mark No.	Description	Parts No.	Mark No.	Description	Parts No.
<b>●MOTHER BOARD ASSEMBLY</b>					
(PWM144B : PD-31/KU type)					
(PWM1449 : PD-8700/HEM, HB, SD and PD-8700-S/HEWM types)					
<b>SEMICONDUCTORS</b>					
△	IC20 REGULATOR IC	M5298P	C104	ELECTR.CAPACITOR	CEAS101M10
	IC101 PRE AMP IC	CXA1471S	C110	CERAMIC CAPACITOR	CKCYF103Z50
	IC151 SERVO IC	CXA1272S	C151-C153 ELECTR.CAPACITOR	CEAS101M10	
▲	IC201,LC202 POWER OP-AMP,IC	LA6520	C155	CERAMIC CAPACITOR	CKCYB182K50
	IC301 EFM DEMODULATION IC	CXD2500AQ	C156	CERAMIC CAPACITOR	CGCYX383K25
	Q101 TRANSISTOR	2SA848S	C157	CERAMIC CAPACITOR	CGCYX103K25
	Q321,Q351 TRANSISTOR	DTC124ES	C158,C159 CERAMIC CAPACITOR	CGCYX104K25	
	Q381 TRANSISTOR	2SC1740S	C160	ELECTR.CAPACITOR	CEAS4R7M50
	Q406 TRANSISTOR	DTA124EES	C161	CERAMIC CAPACITOR	CGCYX104K25
			C162	ELECTR.CAPACITOR	CEAS010M50
△	D11-D14,D52 DIODE	11ES2	C163	CERAMIC CAPACITOR	CGCYX104K25
	D54 ZENNER DIODE	MT2J18B	C164	CERAMIC CAPACITOR	CGCYX103K25
	D801 DIODE	1SS254	C167	CERAMIC CAPACITOR	CKCYF103Z50
	D891-D894 DIODE(PWM1448 only)	1SS254	C168	CERAMIC CAPACITOR	CGCYX383K25
	D895-D897 DIODE	1SS254	C169	CERAMIC CAPACITOR	CGCYX103K25
C170	CERAMIC CAPACITOR	CKCYB382K50			
C171,C172	CERAMIC CAPACITOR	CKCYB472K50			
C202,C207	CERAMIC CAPACITOR	CKCYF103Z50			
C212	CERAMIC CAPACITOR	CKCYB272K50			
C216,C217	ELECTR.CAPACITOR	CEAS380M16			
<b>COILS</b>					
L391,L392 AXIAL INDUCTOR	LAUR22K	C301	CERAMIC CAPACITOR	CGCYX104K25	
L393,L394 AXIAL INDUCTOR	LAU010K	C302	ELECTROLYTIC CAPACIT	CEAS471M6R3	
<b>CAPACITORS</b>					
C11,C13 CERAMIC CAPACITOR	CKCYF103Z50	C304	CERAMIC CAPACITOR	CKCYB182K50	
C15,C16 CERAMIC CAPACITOR	CKCYF103Z50	C307	CERAMIC CAPACITOR	CGCYX473K25	
C25 ELECTR.CAPACITOR	CEAS332M16	C308	CERAMIC CAPACITOR	CGCYX103K25	
C26 ELECTR.CAPACITOR	CEA222M16	C309	ELECTR.CAPACITOR	CEAS4R7M50	
C27 ELECTROLYTIC CAPACIT	CEAS471M6R3	C310	CERAMIC CAPACITOR	CKCYF103Z50	
C28 ELECTR.CAPACITOR	CEAS101M10	C321	CERAMIC CAPACITOR	CGCYX104K25	
C52 ELECTR.CAPACITOR	CEAS101M35	C324	CERAMIC CAPACITOR	CKCYF103Z50	
C60 ELECTR.CAPACITOR	CEAS101M50	C361	CERAMIC CAPACITOR	CKCYF103Z50	
C101,C102 ELECTR.CAPACITOR	CEAS101M10	C362	CERAMIC CAPACITOR	CKCYB102K50	
C103 CERAMIC CAPACITOR	CCCCH200J50	C397	CERAMIC CAPACITOR	CKCYF103Z50	
<b>RESISTORS</b>					
VR102	VR	VRTB6VS223			
VR103	VR	VRTB6VS102			
VR151,VR152	VR	VRTB6VS223			
Other resistors		RD1/6PM[ ] [ ] [ ]			

Mark No.	Description	Parts No.	Mark No.	Description	Parts No.		
<b>OTHERS</b>							
CN101	CONNECTOR	52045-1610	<b>CAPACITORS</b>		CKCYF103Z50		
CN404	CONNECTOR(7P)	KPC7	C503,C504	CERAMIC CAPACITOR			
JA301	OPTICAL OUTPUT JACK	TO1X178	<b>RESISTORS</b>				
JA391,JA392	JACK/12V	PKN1004 (PWM1448 only)	VR501	VARIABLE RESISTOR WITH MOTOR 20KB	PCS1006		
JA393	JACK	PKN1005	Other resistors		RD1/6PM□□□J		
<b>● OPERATE BOARD ASSEMBLY (PWZ2112)</b>							
<b>SEMICONDUCTORS</b>							
IC701	MICROCOMPUTER,IC	PD4329A	<b>COILS</b>		LAU010K		
Q801,Q802	TRANSISTOR	2SD2144S	L501-L503	AXIAL INDUCTOR			
Q803,Q804	TRANSISTOR	2SD1296	<b>CAPACITORS</b>		CKCYF103Z50		
Q805,Q806	TRANSISTOR	2SD2144S	C505-C507	CERAMIC CAPACITOR			
Q807-Q809	TRANSISTOR	DTA124ES	<b>OTHERS</b>				
Q810	TRANSISTOR	DTC124ES	JA501	JACK	PKN1001		
D701-D714	DIODE	ISS254	<b>JACK BOARD ASSEMBLY</b>				
<b>SWITCHES</b>							
S701-S742	SWITCH	PSG1006	<b>● AUDIO BOARD ASSEMBLY (PWZ2118)</b>				
1-20, PGM, DELETE, CHECK, CLEAR, >20, RESERVE, REPEAT, TIME, RND, PEAK SEARCH, 0/L, HI LITE SCAN, AUTO SPACE, COMPU, TIME FADE, <<, >>, □□, □□, STOP(□), PLAY(>)			<b>SEMICONDUCTORS</b>				
<b>CAPACITORS</b>							
C701	ELECTR.CAPACITOR	CEAS330M16	IC801,IC802	D/A CONVERTER,IC	PD3026A		
C702-C714	AXIAL CAPACITOR	CKPUYB221K50	IC803	LOGIC IC	TCT4HCU04AP		
<b>RESISTORS</b>			IC808,IC809	OP-AMP IC	NJM5532DD		
All resistors		RD1/6PM□□□J	IC901	REGULATOR IC	NJM78L12A		
<b>OTHERS</b>			IC902	REGULATOR IC	NJM79L12A		
PHOTO SENSOR UNIT			IC903	REGULATOR IC	NJM7805FA		
V701 FL INDICATOR TUBE			<b>△ D802-D804,D80 DIODE</b>		ISS254		
X701 CERAMIC RESONATOR		VSS1014	<b>▲ D901-D908 DIODE</b>		11ES2		
<b>SW BOARD ASSEMBLY</b>							
<b>SEMICONDUCTORS</b>							
D715 LED		PCX1018	<b>CAPACITORS</b>				
<b>SWITCHES</b>							
S743-S748 SWITCH (ON/STN BY, FADE IN(¬), FADE OUT(¬), ←, →, DISPLAY OFF)		PSG1006	C801,C802	CERAMIC CAPACITOR	CCCOH120J50		
S749		RSH1017	C805,C807	AUDIO FILM CAPACITOR	CFTXA104J50		
<b>RESISTORS</b>			C809,C811	AUDIO FILM CAPACITOR	CFTXA104J50		
R710 CARBON FILM RESISTOR		RD1/6PM103J	C812,C813	CERAMIC CAPACITOR	CCCOH390J50		
<b>HEADPHONE BOARD ASSEMBLY</b>			C819,C820	CERAMIC CAPACITOR	CCCOH390J50		
<b>SEMICONDUCTORS</b>			<b>C821</b>		CFTXA881J50		
IC501 OP-AMP,IC		M5218AL	C824	AUDIO FILM CAPACITOR	CFTXA562J50		
			C826	ELECTR.CAPACITOR	CEAS470M50		
			C828	PL.STYRENE CAPACITOR	CQSA102J50		
			C830,C832	AUDIO FILM CAPACITOR	CFTXA104J50		
			C833,C834	AUDIO FILM CAPACITOR	CFTXA104J50		
			C835,C836	CERAMIC CAPACITOR	CCCOH390J50		
			C838,C840	CERAMIC CAPACITOR	CCCOH390J50		
			C841	AUDIO FILM CAPACITOR	CFTXA562J50		
			C842	AUDIO FILM CAPACITOR	CFTXA681J50		
			<b>C843</b>		CFTXA104J50		
			C844-C846	PL-STYRENE CAPACITOR	CQSA102J50		
			C860,C861	ELECTR.CAPACITOR	CEAS330M16		
			C863,C864	CERAMIC CAPACITOR	CKCYF103Z50		
			C870	ELECTROLYTIC CAPACIT	CEAS471M6R3		
			<b>C901,C902</b>		CEAS102M25		
			C903,C904	ELECTR.CAPACITOR	CEAS471M16		
			C905	ELECTR.CAPACITOR	CEAS332M16		
			C906	ELECTR.CAPACITOR	CEAS102M16		
			C914-C919	CERAMIC CAPACITOR	CKCYF103Z50		

<u>Mark</u>	<u>No.</u>	<u>Description</u>	<u>Parts No.</u>
<b>RESISTORS</b>			
	All resistors		RD1/6PM(□□□)
<b>OTHERS</b>			
	CN801 CONNECTOR(9P)	KPC9	
	JA801 JACK	PKB1010	
	JA802 JACK	PKB1010	
	X801 XTAL RES (OSC)	PSS1006	

## **S. TRANS BOARD ASSEMBLY**

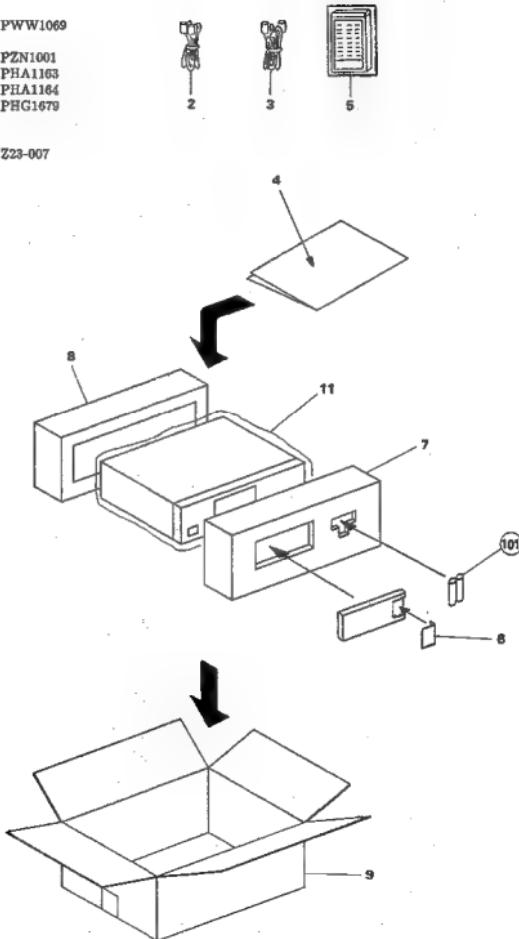
No electrical parts are supplied this assembly.

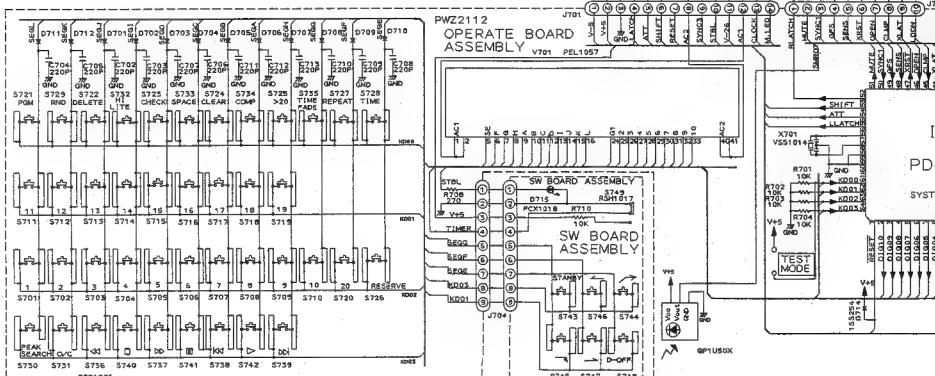
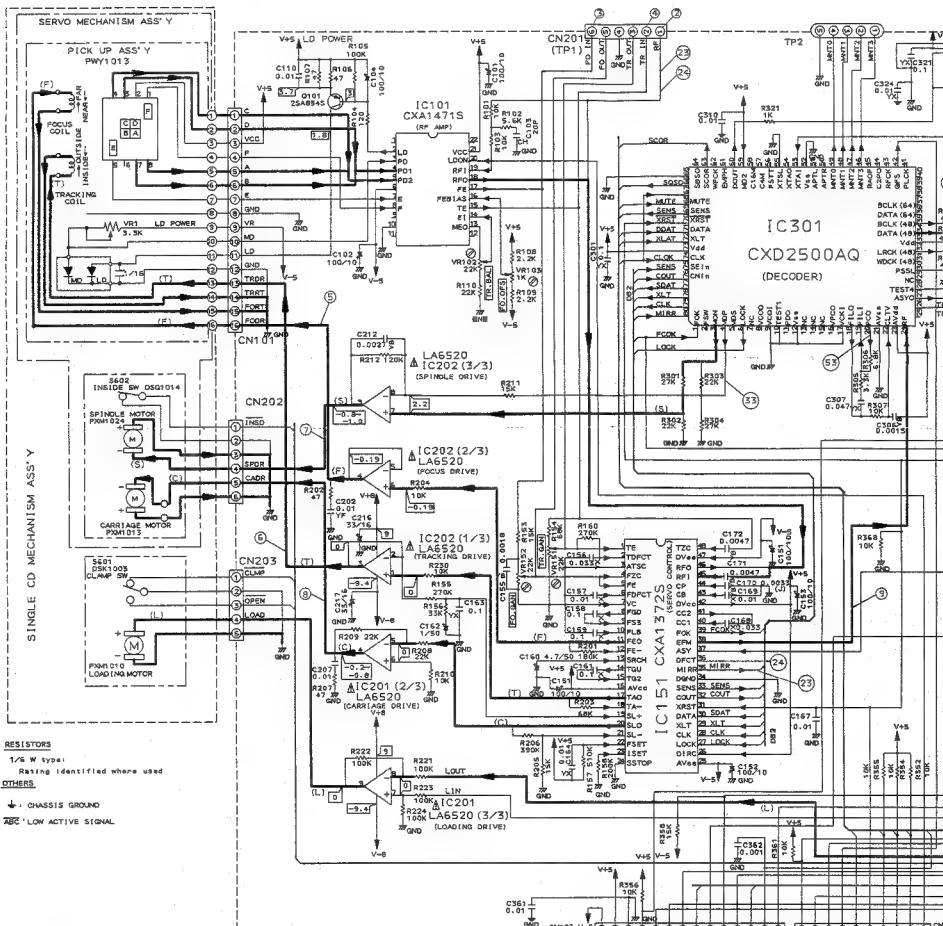
## **A. TRANS BOARD ASSEMBLY**

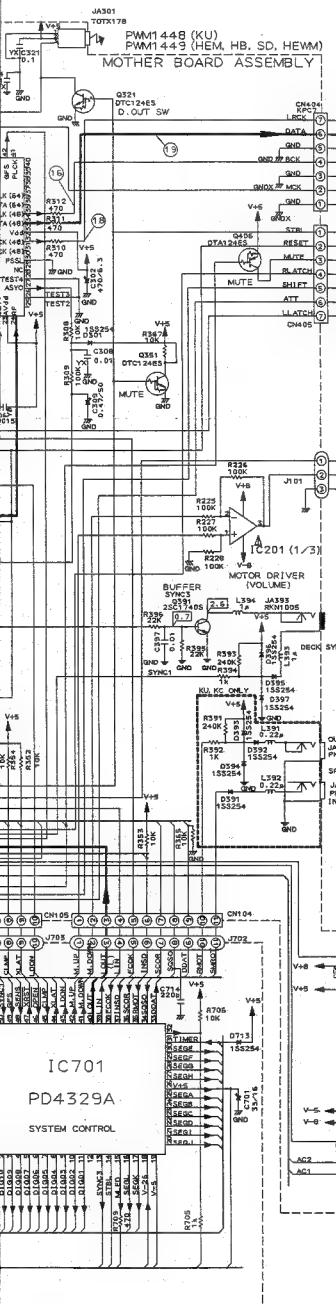
No electrical parts are supplied this assembly.

## 4. PACKING

Mark	No.	Description	Parts No.
1			
2	Cord with plug(mini plug)	PDE-319	
3	Cord with plug	PDE1001	
4	Operating instructions (English)	PRB1151	
5	Remote control unit (CU-PD053)	PWW1069	
6	Battery lid	PZN1001	
7	Styrol protector F	PHA1163	
8	Styrol protector R	PHA1164	
9	CD Packing case	PHG1679	
10			
11	Sheet	Z23-007	
101	Mangan battery(R03, AAA)		

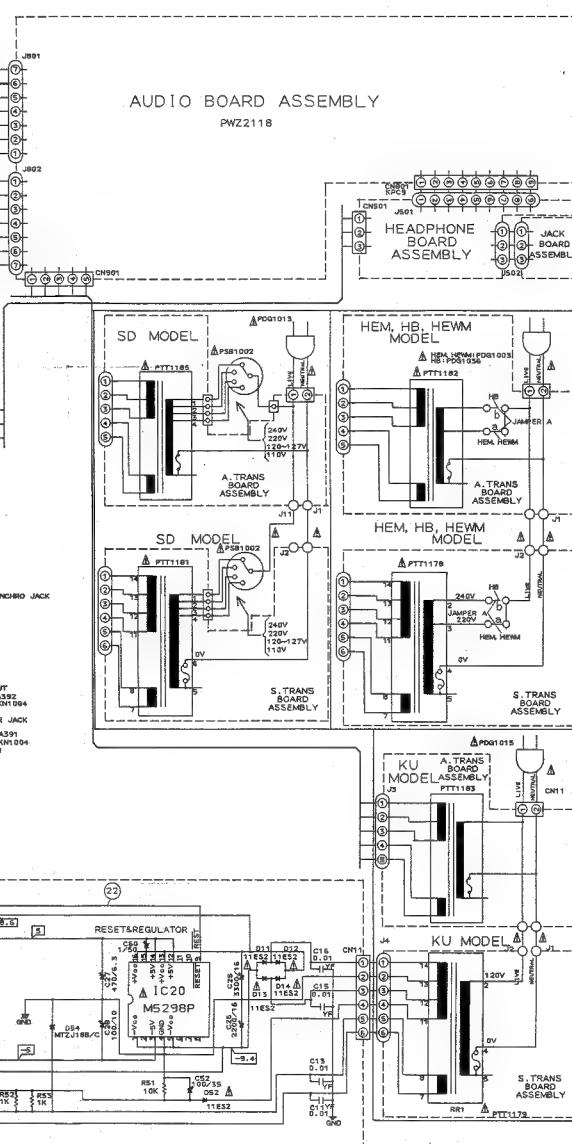






## AUDIO BOARD ASSEMBLY

GWZ2448

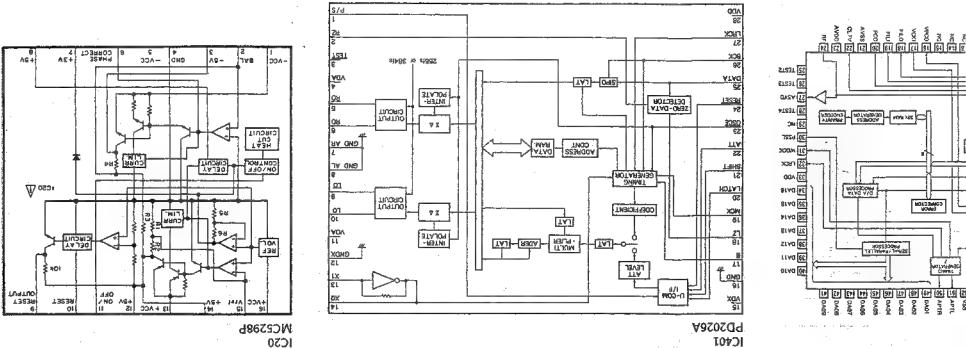


Pin	Voltage	Pin	Voltage
1	0	28	5
2	0	28	5
3	0	27	5
4	0	28	5
5	0	29	5
6	0	30	5
7	0	31	5
8	0	32	0
9	0	33	5
10	0	34	0
11	1	25	5
12	0	26	R.C.
13	0.2	37	5
14	0	29	5
15	0	30	5
16	0	31	5
17	0	41	-1.7
18	0	42	5
19	0	43	-0.7
20	0.2-0.8	44	-1.6
21	0	45	0
22	-1	48	0.8
23	1.3	47	-5
24	0	48	0

Group (Polarization)	FCID	Panel	Panel ID	Panel No.	Voltage
	5	5		5	5.0
	2 -> -2, -1, 3	34		3, 4, 7	3.5
	4 -> -2, -1, 3	35		3, 5	3.5
	4 -> -2, -1, 3	36		3, 5	3.5
	4 -> -2, -1, 3	37		3, 6	3.5
	4 -> -2, -1, 3	38		3, 6	3.5
	7 -> 2, -4, 3	39		0	0
	8 -> -2, -3, 4	40		0	0
	8 -> -2, -3, 4	41		0	0
	11, 12 -> -2, -3	42		0	0
	11, 12 -> -2, -3	43		5, 9	5.0
	11, 12 -> -2, -3	44		5, 9	5.0
	13	5	45	5	5.0
	13	5	46	5	5.0
	4, 9	-1	47	5, 6	5.0
	16 -> -2, -5, -6, -7	48		2, 1 - 3	5.0
	17 -> -1, 0, 49	49		5, 6	5.0
	18 -> -5, 0, 50	50		5, 6	5.0
	20 -> -1, 0, 51	51		5, 6	5.0
	20 -> -1, 0, 51	52		5, 6	5.0
	20 -> -1, 0, 51	53		5, 6	5.0
	21 -> -2, -3, -5, 54	54		5, 6	5.0
	21 -> -2, -3, -5, 54	55		5, 6	5.0
	21 -> -2, -3, -5, 54	56		2, 3	5.0
	25 -> -6, -8, 58	58		2, 3	5.0
	25 -> -6, -8, 58	59		2, 3	5.0
	25 -> -6, -8, 58	60		2, 3	5.0
	26 -> -1, 0, 59	60		5, 6	5.0
	29 -> -12, -15, 61	61		5, 6	5.0
	30 -> -12, -15, 62	62		5, 6	5.0
	31	0	63	0	0

- (F) : FOCUS SERVO SIGNAL
- (T) : TRACKING SERVO SIGNAL
- (S) : SPINDLE SERVO SIGNAL
- (C) : CARRIAGE SERVO SIGNAL
- (L) : LOADING SERVO SIGNAL

(CXA1471S)			
Pin No.	Voltage	Pin No.	Voltage
1	N.C.	12	N.C.
2	2.8	13	-0.8
3	-4.7	14	-0.7
4	D	15	0
5	0	16	0
6	-5	17	0
7	D	18	0.8
8	0	19	0
9	N.C.	20	5
10	D	21	5
11	N.C.	22	N.C.



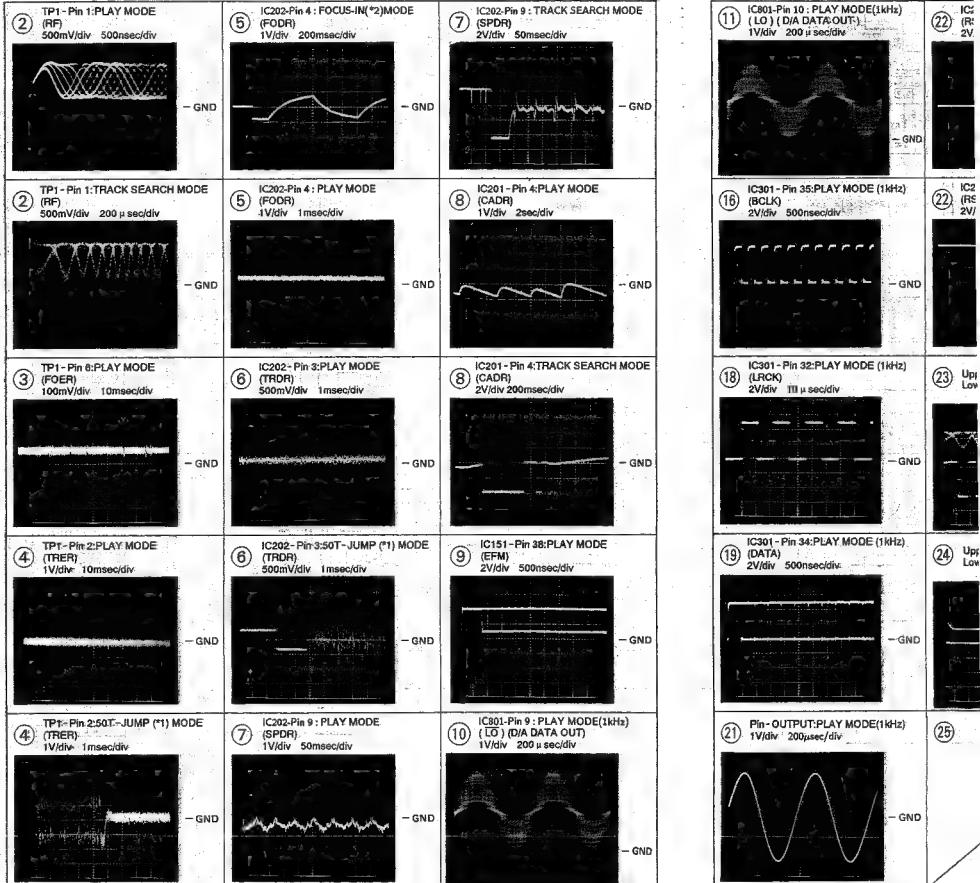
## 5. SCHEMATIC DIAGRAM AND P.C.BOARDS CONNECTION DIAGRAM

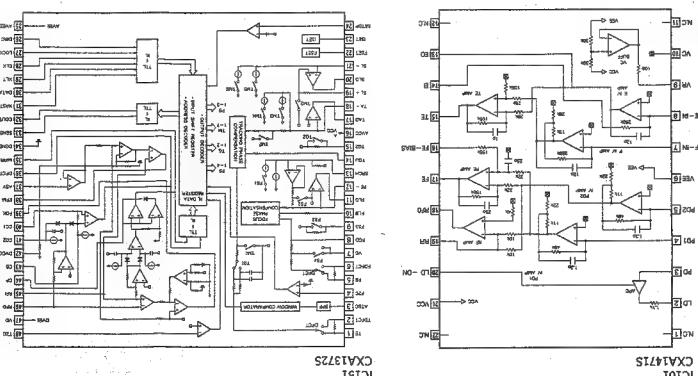
### 5.1 Wave Forms

Note: The encircled numbers denote measuring in the schematic diagram.

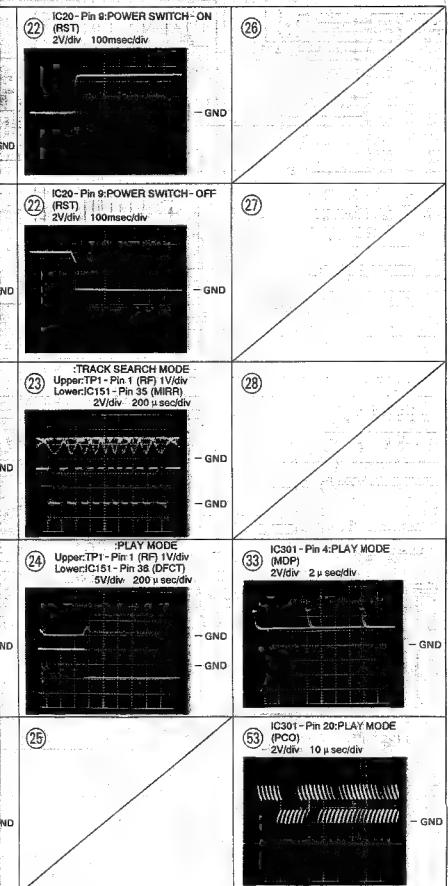
\*1 SOT-JUMP: After switching to the pause mode, press the manual search key.

\*2 FOCUS-IN: Press the key without loading a disc.





• IC BLOCK DIAGRAM



1.RESISTORS:

Indicated in  $\Omega$ , 1/4W, 1/8W and 1/16W,  $\pm 5\%$  tolerance unless otherwise noted  
k; k2 M; MΩ (F);  $\pm 1\%$ ; (G);  $\pm 2\%$ ; (K);  $\pm 10\%$ ; (M);  $\pm 20\%$  tolerance.

2.CAPACITORS:

Indicated in capacity ( $\mu F$ )/voltage(V) unless otherwise noted p; pF. Indication without voltage is 50V except electrolytic capacitor.

3.VOLTAGE, CURRENT:

$\square$  : DC voltage (V) at play state.  
 $\square_{DC}$  : DC current at play state.  
Value in  $\square$  is DC current at stop state.

4.OTHERS:

→ : Signal route.

② : Ground point.

The Δ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.

\* marked capacitors and resistors have parts numbers.

This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

5.SWITCHES : (The underlined indicates the switch position)

SWITCH BOARD ASSEMBLY

S743 : POWER ON-OFF

OPERATE BOARD ASSEMBLY

S701 : 1	S725 : >20
S702 : 2	S726 : RESERVE
S703 : 3	S727 : REPEAT
S704 : 4	S728 : TIME
S705 : 5	S729 : RND
S706 : 6	S730 : PEAK SEARCH
S707 : 7	S731 : O/L
S708 : 8	S732 : WHITE SCAN
S709 : 9	S733 : AUTO SPACE
S710 : 10	S734 : COMPR
S711 : 11	S735 : TIME FADE ] EDI
S712 : 12	S736 : $\square$ ] MANUAL SEARCH
S713 : 13	S737 : $\square$ ] TRACK SEARCH
S714 : 14	S738 : $\square$ ]
S715 : 15	S739 : $\square$ ]
S716 : 16	S740 : STOP( $\square$ )
S717 : 17	S741 : PAUSE( $\square$ )
S718 : 18	S742 : PLAY( $\square$ )
S719 : 19	S743 : ON/STN BY
S720 : 20	S744 : FADE (+/-)
S721 : PGM	S745 : FADE OUT(-)
S722 : DELETE	S746 : $\square$ INDEX
S723 : CHECK	S747 : $\square$
S724 : CLEAR	S748 : DISPLAY OFF

Line Voltage Selection (For HB,HFM and HEMW types)

Line voltage can be changed with the following steps.

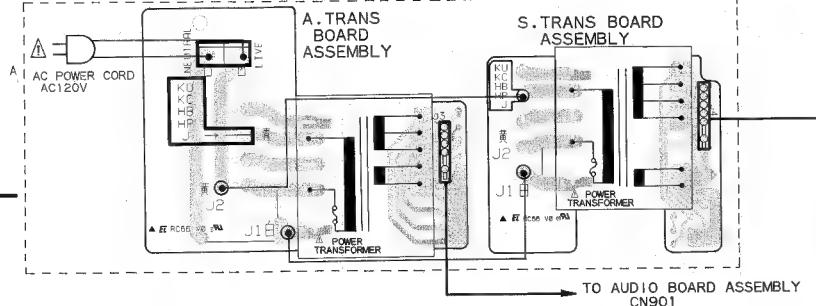
1. Disconnect the AC power cord.
2. Remove the top cover.
3. Change the position of the jumper wire A as follows

Voltage	Jumper wire A position
220V	a
240V	b

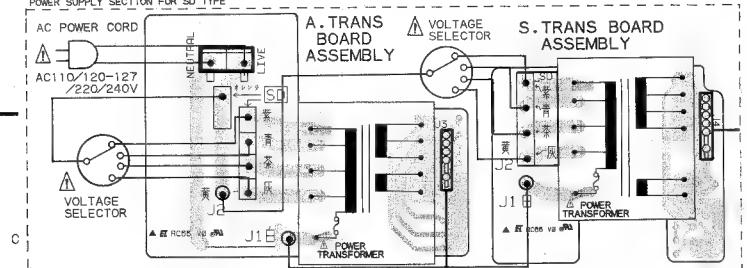
4. Stick the line voltage label on the rear panel.

Parts No.	Description
AXX-193	220V label
AXX-192	240V label

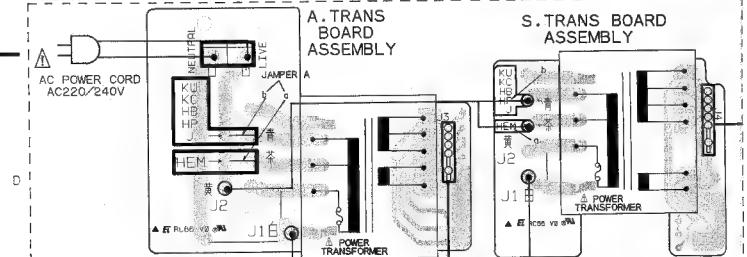
POWER SUPPLY SECTION FOR KU TYPE



POWER SUPPLY SECTION FOR SD TYPE



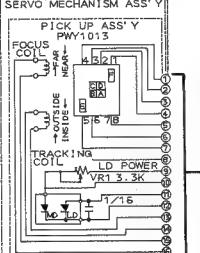
POWER SUPPLY SECTION FOR HEM, HB AND HEWM TYPES



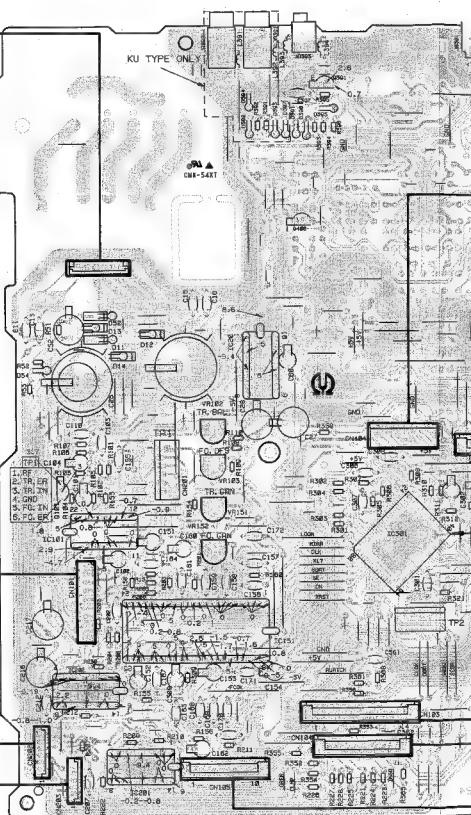
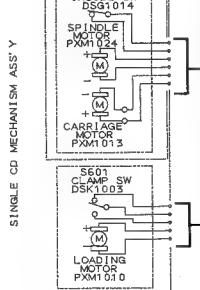
MOTHER BOARD ASSEMBLY

(PWM1448:KU TYPE)  
(PWM1449:HEM,HB,SD AND HEWM TYPES)

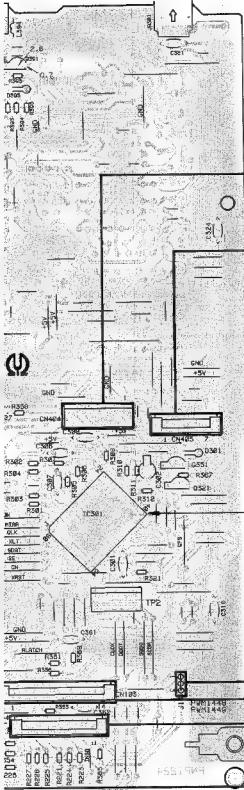
SERVO MECHANISM ASS'Y



SINGLE CD MECHANISM ASS'Y

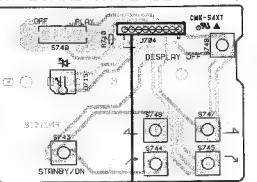


TYPES)

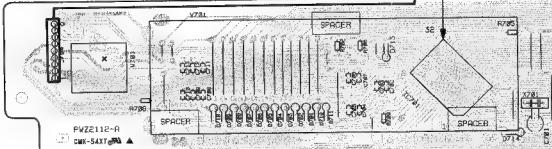


H301 (C20204D)		
Ref.	Part No.	Voltage
1	S	N.C.
2	N.C.	0
3	S	N.C.
4	2.5	44 N.C.
5	S	N.C.
6	S	4.4
7	N.C.	47 0
8	S	N.C.
9	0	0 - 0.3
10	0	50 N.C.
11	N.C.	50 N.C.
12	S	0
13	N.C.	53 2.5
14	N.C.	59 N.C.
15	N.C.	59 0
16	N.C.	50 N.C.
17	0	50 N.C.
18	2.5	50 N.C.
19	0	50 0
20	2.4	60 0
21	0	60 N.C.
22	2.5	60 N.C.
23	0	60 N.C.
24	2.5	60 N.C.
25	N.C.	60 N.C.
26	0	1.3 - 4.6
27	2.5	5
28	N.C.	0
29	2.5	14 0
30	N.C.	10 5
31	1.3 - 2.7	11 5
32	7.5	12 5
33	N.C.	0
34	2.5	14 0
35	N.C.	15 5
36	N.C.	10 0
37	N.C.	18 5
38	N.C.	18 0
39	N.C.	50 0
40	N.C.	50 0

### SW BOARD ASSEMBLY



### OPERATE BOARD ASSEMBLY (PWZ2112)

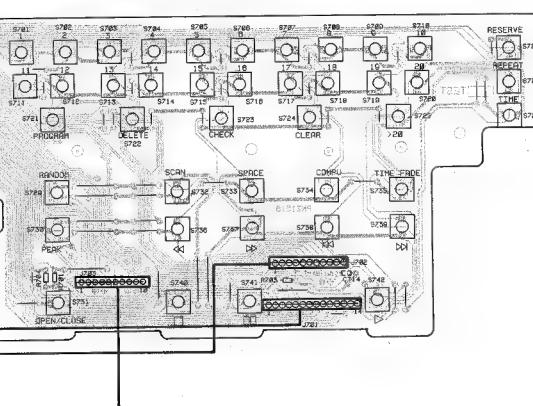


IC701

I201 (C20205A)		
Ref.	Part No.	Voltage
1	5.6	23 5.0
2	24 - 24	3.3 3.2 4.1
3	24 - 24	3.3 3.2 4.1
4	24 - 24	3.3 36 0
5	24 - 24	3.3 37 0.9
6	24 - 24	3.3 37 0.9
7	24 - 24	3.3 39 0
8	24 - 24	3.3 40 0
9	24 - 24	3.41 0
10	24 - 24	3.41 0
11	24 - 24	3.43 5.0
12	0	44 5.0
13	0	44 5.0
14	0	46 5.0
15	4.9	47 5.0
16	71.5 - 27.8	48 2.1
17	1.5	50 5.0
18	-30.0	50 5.0
19	5.0	51 0
20	-11.0 - 17.8	53 5.0
21	1.5	53 5.0
22	-12.5 - 15.5	54 5.0
23	-3.4 - 4.4	55 5.0
24	1.5	55 5.0
25	-4.5 - 5.5	57 5.0
26	5.0	58 0
27	0	58 0
28	-1.5 - 1.5	60 5.0
29	-12.5 - 15.5	60 0
30	-12.5 - 15.5	60 0
31	0	61 0
32	5.0	64 0

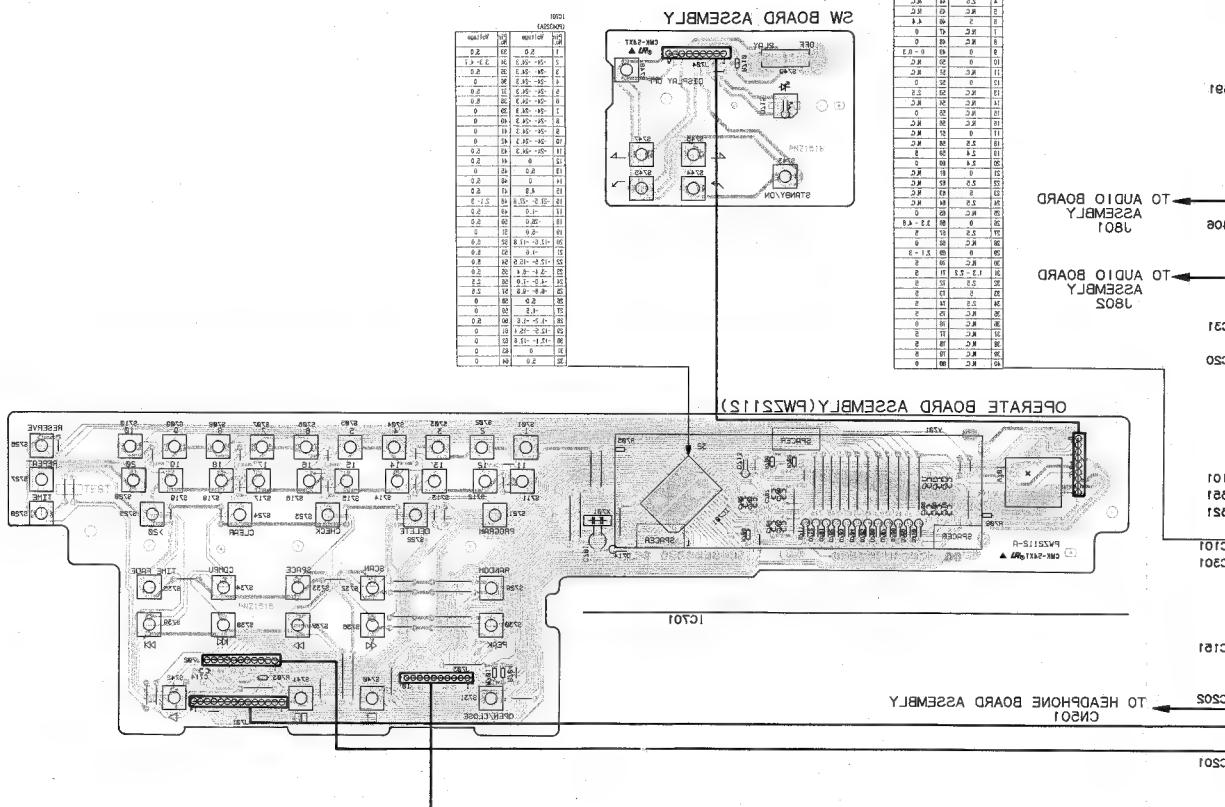
Part name	PCB pattern diagram indication		Corresponding part symbol	Part name
	Indication	Symbol		
Transistor				Ceramic capacitor
FET				Mylar capacitor
Diode				Styrofoam capacitor
Zener diode				Electrolytic capacitor (Non polarized)
LED				Electrolytic capacitor (Polarized)
Varactor				Electrolytic capacitor (Polarized)
Tact switch				Power capacitor
Inductor				Series-resistor
Capacitor				Resistor
Transformer				Thermistor
Filter				

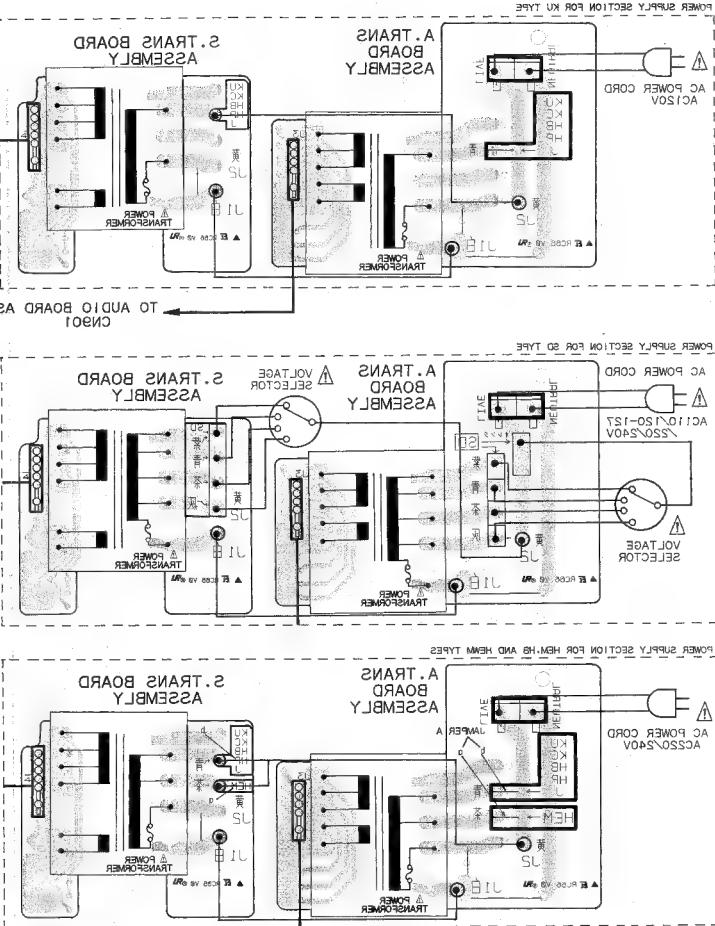
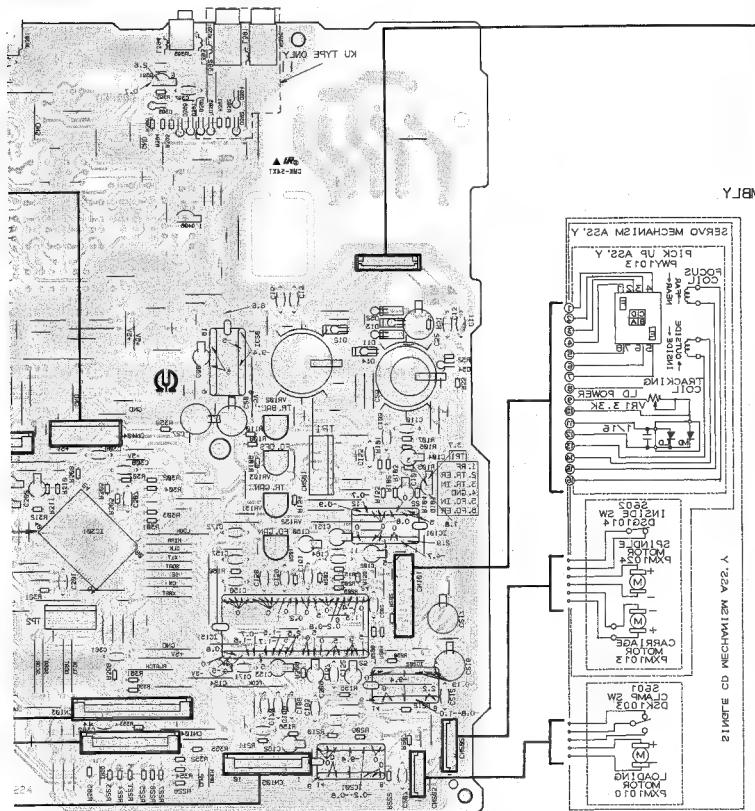
- This P.C.B. connection diagram is viewed from the parts mounted side.
- The parts which have been mounted on the board can be replaced with those shown with the corresponding wiring symbols listed in the table.
- The capacitor terminal marked with shows negative terminal.
- The diode terminal marked with shows anode terminal.
- The diode terminal marked with shows cathode terminal.



This P.C.B. connection diagram is viewed from the foil side.

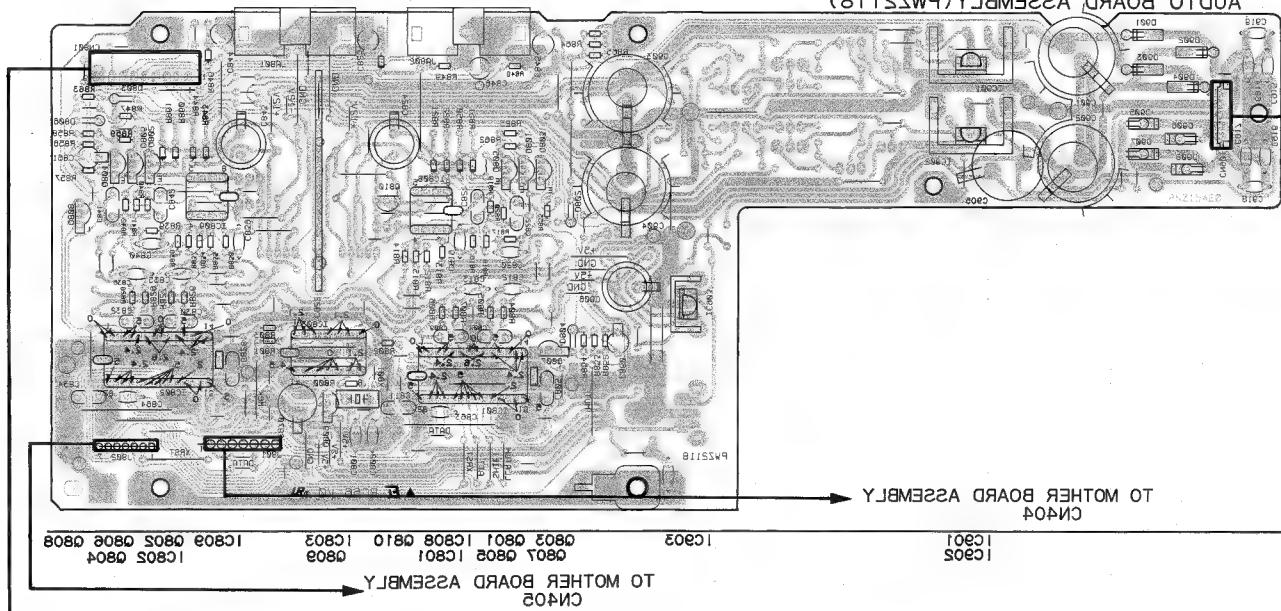
(239)



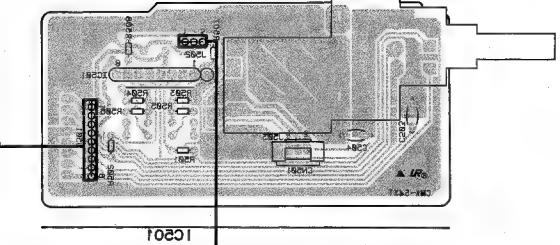


This P.C.B. connection diagram is viewed from the foil side.

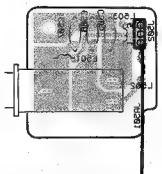
AUDIO BOARD ASSEMBLY (PM25118)



HEADPHONE BOARD ASSEMBLY

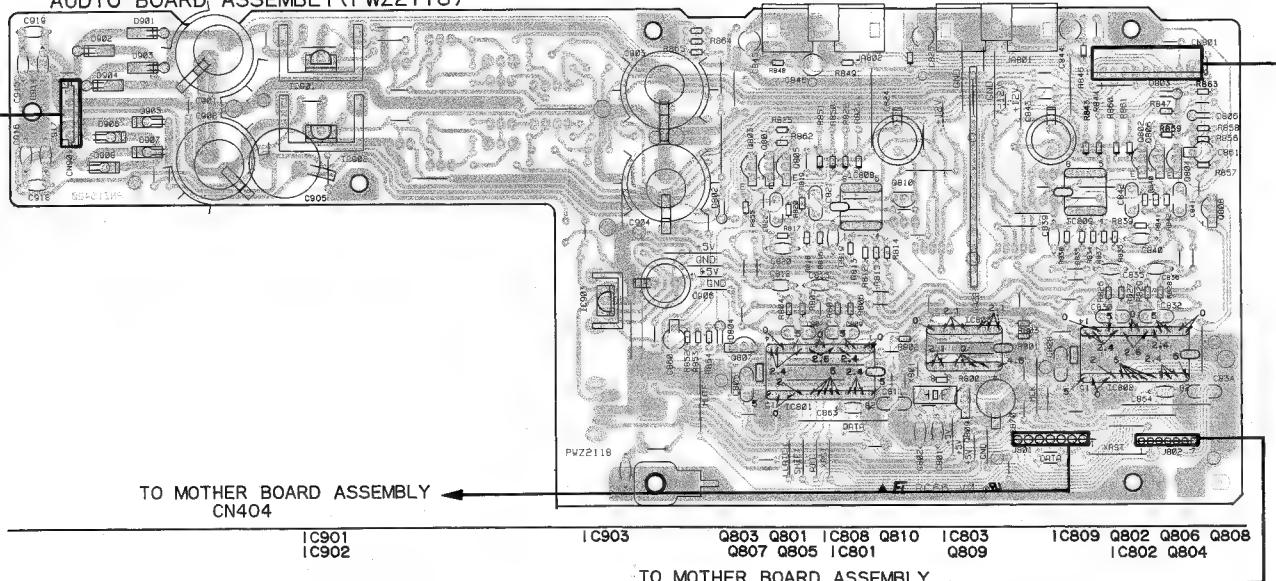


## JACK BOARD ASSEMBLY



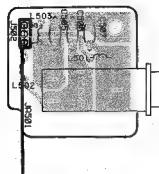
2 3 4 5 6

AUDIO BOARD ASSEMBLY(PWZ2118)



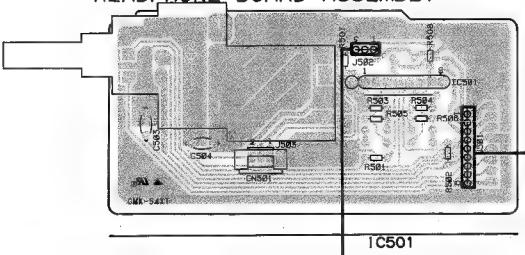
B C D

JACK BOARD ASSEMBLY

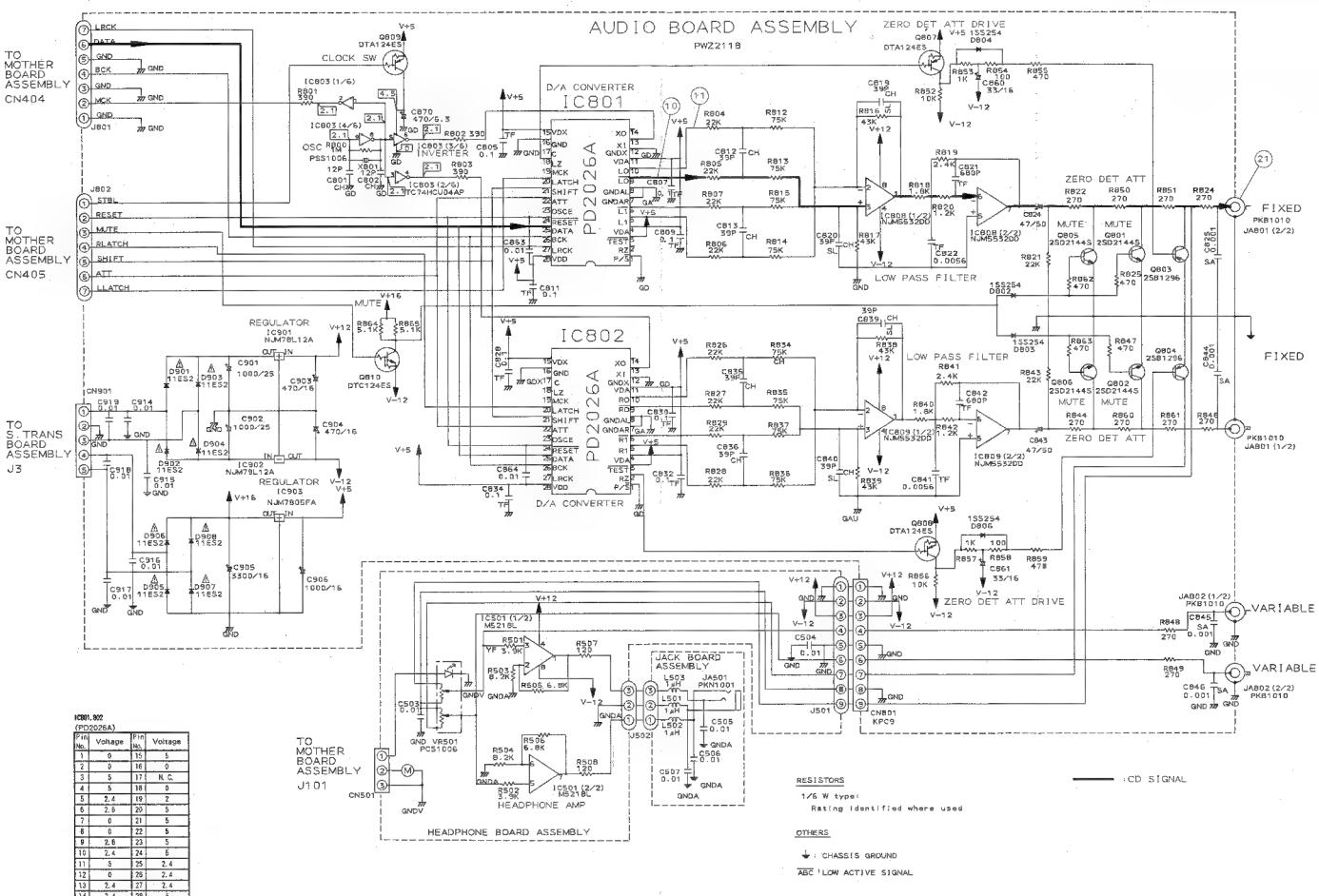


E F G H

HEADPHONE BOARD ASSEMBLY



1 2 3 4 5 6



## 6. ADJUSTMENTS

### 6.1 ADJUSTMENT METHODS

If a disc player is adjusted incorrectly or inadequately, it may malfunction or not work at all even though there is nothing at all wrong with the pickup or the circuitry. Adjust correctly following the adjustment procedure.

#### ● Adjustment items/verification items and order

Step	Item	Test point	Adjustment location
1	Focus offset adjustment	TP1, Pin 6(FCS. ERR)	VR103(FCS. OFS)
2	Grating adjustment	TP1, Pin 2(TRK. ERR)	Grating adjustment slit
3	Tracking error balance adjustment	TP1, Pin 2(TRK. ERR)	VR102(TRK. BAL.)
4	Pickup radial/tangential direction tilt adjustment	TP1, Pin 1(RF)	Radial tilt adjustment screw, Tangential tilt adjustment screw
5	RF level adjustment	TP1, Pin 1(RF)	VR1(RF level)
6	Focus servo loop gain adjustment	TP1, Pin 5(FCS. IN) TP1, Pin 6(FCS. ERR)	VR152(FCS. GAN)
7	Tracking servo loop gain adjustment	TP1, Pin 3(TRK. IN) TP1, Pin 2(TRK. ERR)	VR151(TRK. GAN)
8	Focus error signal verification	TP1, Pin 6(FCS. ERR)	_____

#### ● Abbreviation table

FCS. ERR	:Focus Error
FCS. OFS	:Focus Offset
TRK. ERR	:Tracking Error
TRK. BAL	:Tracking Balance
FCS. GAN	:Focus Gain
TRK. GAN	:Tracking Gain
FCS. IN	:Focus In
TRK. IN	:Tracking In

#### ● Measuring instruments and tools

1. Dual trace oscilloscope (10:1 probe)
2. Low-frequency oscillator
3. Test disc (YEDS-7)
4. 12-cm disc (with at least about 70 minutes recording)
5. Low-pass filter (39 kΩ + 0.001 μF)
6. Resistor (100 kΩ )
7. Hexagonal wrench (M3 mm)
8. Standard tools

#### ● Test point and adjustment variable resistor positions

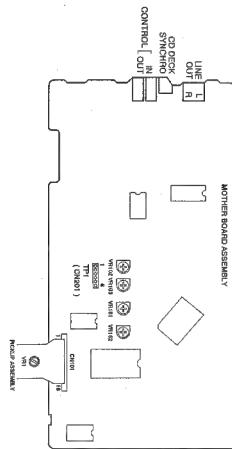


Figure 1 Adjustment Locations

#### ● Notes

1. Use a 10:1 probe for the oscilloscope.
2. All the knob positions (settings) for the oscilloscope in the adjustment procedures are for when a 10:1 probe is used.

#### ● Test mode

These models have a test mode so that the adjustments and checks required for service can be carried out easily. When these models are in test mode, the keys on the front panel work differently from normal. Adjustments and checks can be carried out by operating these keys with the correct procedure. For these models, all adjustments are carried out in test mode.

#### [Setting these models to test mode]

How to set this model into test mode.

1. Unplug the power cord from the AC socket.
2. Short the test mode jumper wires. (See Figure 1.)
3. Plug the power cord back into the AC socket.

When the test mode is set correctly, the display is different from what it usually is when the power is turned on. If the display is still the same as usual, test mode has not been set correctly, so repeat Steps 1 – 3.

**[Release from test mode]**

Here is the procedure for releasing the test mode:

1. Press the STOP key and stop all operations.
2. Unplug the power cord from the AC socket.

**[Operations of the keys in test mode]**

Code	Key name	Function in test mode	Explanation
	PROGRAM	Focus servo close	<p>The laser diode is lit up and the focus actuator is lowered, then raised slowly and the focus servo is closed at the point where the objective lens is focused on the disc.</p> <p>With the player in this state, if you lightly rotate the stopped disc by hand, you can hear the sound the focus servo.</p> <p>If you can hear this sound, the focus servo is operating correctly. If you press this key with no disc mounted, the laser diode lights up, the focus actuator is pulled down, then the actuator is raised and lowered twice and returned to its original position.</p>
▷	PLAY	Spindle servo ON	<p>Starts the spindle motor in the clockwise direction and when the disc rotation reaches the prescribed speed (about 500 rpm at the inner periphery), sets the spindle servo in a closed loop.</p> <p>Be careful. Pressing this key when there is no disc mounted makes the spindle motor run at the maximum speed.</p> <p>If the focus servo does not go correctly into a closed loop or the laser light shines on the mirror section at the outermost periphery of the disc, the same symptom is occurred.</p>
□□	PAUSE	Tracking servo close/open	<p>Pressing this key when the focus servo and spindle servo are operating correctly in closed loops puts the tracking servo into a closed loop, displays the track number being played back and the elapsed time on the front panel, and outputs the playback signal.</p> <p>If the elapsed time is not displayed or not counted correctly or the audio is not played back correctly; it may be that the laser is shining on the section with no sound recorded at the outer edge of the disc, that something is out of adjustment, or that there is some other problem.</p> <p>This key is a toggle key and open/close the tracking servo alternately. This key has no effect if no disc is mounted.</p>

Code	Key name	Function in test mode	Explanation
	MANUAL SEARCH REV	Carriage reverse (inwards)	Moves the pickup position toward the inner diameter of the disc. When this key is pressed with the tracking servo in a closed loop, the tracking servo automatically goes into an open loop. Since the motor does not automatically stop at the mechanical end point in test mode, be careful with this operation.
	MANUAL SEARCH FWD	Carriage forward (outwards)	Moves the pickup position toward the outer diameter of the disc. When this key is pressed with the tracking servo in a closed loop, the tracking servo automatically goes into an open loop. Since the motor does not automatically stop at the mechanical end point in test mode, be careful with this operation.
	STOP	Stop	Switches off all the servos and initialized. The pickup remains where it was when this key was pressed.
	OPEN/CLOSE	Disc tray open/close	Open/close the disc tray. This key is a toggle key and open/close tray alternately. Pressing this key when the disc is turning stops the disc, then opens the tray. This key operation does not affect the position of the pickup.

**[How to play back a disc in test mode]**

In test mode, since the servos operate independently, playing back a disc requires that you operate the keys in the correct order to close the servos.

Here is the key operation sequence for playing back a disc in test mode.

**PROGRAM**      Lights up the laser diode and closes the focus servo.



**PLAY ▶**      Starts the spindle motor and closes the spindle servo.



**PAUSE ■**      Closes the tracking servo.

Wait at least 2-3 seconds between each of these operations.

## 1. Focus Offset Adjustment

● Objective	Sets the DC offset for the focus error amp.		
● Symptom when out of adjustment	The model does not focus in and the RF signal is dirty.		
● Measurement instrument connections	Connect the oscilloscope to TPI, Pin 6 (FCS. ERR) [Settings] 5 mV/division 10 ms/division DC mode	● Player state ● Adjustment location ● Disc	Test mode, stopped (just the Power switch on) VR103 (FCS. OFS) None needed

### [Procedure]

Adjust VR103 (FCS. OFS) so that the DC voltage at TPI, Pin 6 (FCS. ERR) is  $-150 \pm 50$  mV.

## 2. Grating Adjustment

● Objective	To align the tracking error generation laser beam spots to the optimum angle on the track.		
● Symptom when out of adjustment	Play does not start, track search is impossible, tracks are skipped.		
● Measurement instrument connections	<p>Connect the oscilloscope to TP1, Pin 2(TRK. ERR) via a low pass filter. (See Figure 2)</p> <p>[Settings] 50 mV/division 5 ms/division DC mode</p>	<ul style="list-style-type: none"> <li>● Player state</li> <li>● Adjustment location</li> <li>● Disc</li> </ul>	<p>Test mode, focus and spindle servos closed and tracking servo open</p> <p>Pickup grating adjustment slit</p> <p>12-cm disc. (YEDS-7 can not be used.)</p>

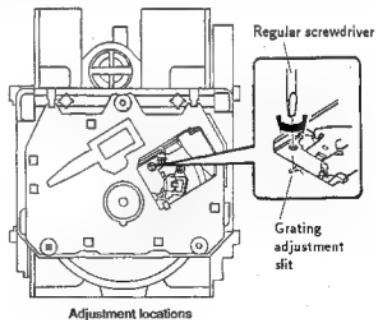
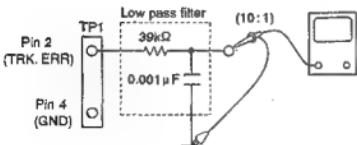
### [Procedure]

- Move the pickup to the outer edge of the disc with the MANUAL SEARCH FWD  $\triangleright$  or REV  $\triangleleft$  key.
- Press the PROGRAM key, then the PLAY  $\triangleright$  key in that order to close the focus servo then the spindle servo.
- Insert an ordinary screwdriver into the grating adjustment slit and adjust the grating to find the null point. For more details, see the next page.
- If you slowly turn the screwdriver clockwise from the null point, the amplitude of the wave gradually increases, then if you continue turning the screwdriver, the amplitude of the wave becomes smaller again. Turn the screwdriver clockwise from the null point and set the grating to the first point where the wave amplitude reaches its maximum.

Reference : Figure 3 shows the relation between the angle of the tracking beam with the track and the waveform.

**Note** : The amplitude of the tracking error signal is about 3 Vp-p (when a  $39\text{ k}\Omega + 0.001\text{ }\mu\text{F}$  low pass filter is used). If this amplitude is extremely small (2 Vp-p or less), the objective lens or the pickup malfunction may be the cause. If the difference between the amplitude of the error signal at the innermost edge and outermost edge of the disc is more than 10%, the grating is not adjusted to the optimum point, so adjust it again.

- Return the pickup to more or less midway across the disc with the MANUAL SEARCH REV  $\triangleleft$  key, press the PAUSE  $\square$  key and double check that the track number and elapsed time are displayed on the front panel. If they are not displayed at this time or the elapsed time changes irregularly, double check the null point and adjust the grating again.



**[How to find the null point]**

When you insert the regular screwdriver into the slit for the grating adjustment and change the grating angle, the amplitude of the tracking error signal at TP1, Pin 2 changes. Within the range for the grating, there are five or six locations where the amplitude of the wave reaches a minimum. Of these five or six locations, there is only one at which the envelope of the waveform is smooth. This location is where the three laser beams divided by the grating are all right above the same track. (See Figure 3.)

This point is called the null point. When adjusting the grating, this null point is found and used as the reference position.

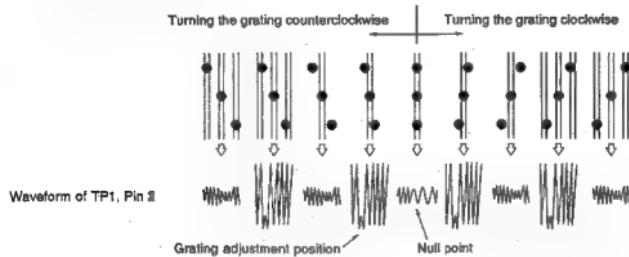
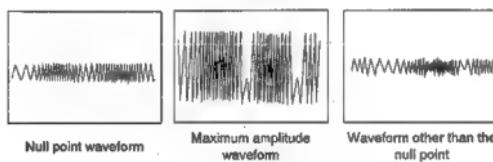


Figure 3

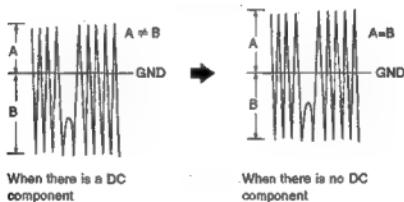


### 3. Tracking Error Balance Adjustment

● Objective	To correct for the variation in the sensitivity of the tracking photodiode.		
● Symptom when out of adjustment	Play does not start or track search is impossible.		
● Measurement instrument connections	<p>Connect the oscilloscope to TP1, Pin 2 (TRK. ERR). This connection may be via a low pass filter.</p> <p>[Settings] 50 mV/division 5 ms/division DC mode</p>	<ul style="list-style-type: none"> <li>● Player state</li> <li>● Adjustment location</li> <li>● Disc</li> </ul>	<p>Test mode, focus and spindle servos closed and tracking servo open</p> <p>VR102 (TRK. BAL)</p> <p>YEDS-7</p>

#### [Procedure]

1. Move the pickup to midway across the disc ( $R=35\text{ mm}$ ) with the MANUAL SEARCH FWD  $\gg$  or REV  $\ll$  key.
2. Press the PROGRAM key, then the PLAY  $\triangleright$  key in that order to close the focus servo then the spindle servo.
3. Line up the bright line (ground) at the center of the oscilloscope screen and put the oscilloscope into DC mode.
4. Adjust VR102 (TRK. BAL) so that the positive amplitude and negative amplitude of the tracking error signal at TP1, Pin 2 (TRK. ERR) are the same (in other words, so that there is no DC component).



#### 4. Pickup Radial/Tangential Tilt Adjustment

● Objective	To adjust the angle of the pickup relative to the disc so that the laser beams are shone straight down into the disc for the best read out of the RF signals.		
● Symptom when out of adjustment	Sound broken; some discs can be played but not others.		
● Measurement instrument connections	<p>Connect the oscilloscope to TP1, Pin 1 (RF).</p> <p>[Settings] 20 mV/division 200 ns/division AC mode</p>	<ul style="list-style-type: none"> <li>● Player state</li> <li>● Adjustment location</li> <li>● Disc</li> </ul>	<p>Test mode, play</p> <p>Pickup radial tilt adjustment screw and tangential tilt adjustment screw</p> <p>12-cm disc. (YEDS-7 can not be used.)</p>

##### [Procedure]

1. Press the MANUAL SEARCH FWD ▶▶ or REV ◀◀ key so that the radial/tangential tilt screws can be adjusted. Press the PROGRAM key, the PLAY ▶ key, then the PAUSE III key in that order to close the focus servo then the spindle servo and put the player into play mode.
2. First, adjust the radial tilt adjustment screw with a Phillips screwdriver so that the eye pattern (the diamond shape at the center of the RF signal) can be seen the most clearly.
3. Next, adjust the tangential tilt adjustment screw with a Phillips screwdriver so that the eye pattern (the diamond shape at the center of the RF signal) can be seen the most clearly (Figure 5).
4. Adjust the radial tilt adjustment screw and the tangential tilt adjustment screw again so that the eye pattern can be seen the most clearly. As necessary, adjust the two screws alternately so that the eye pattern can be seen the most clearly.

Note: Radial and tangential mean the directions relative to the disc shown in Figure 4.

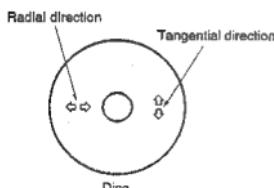
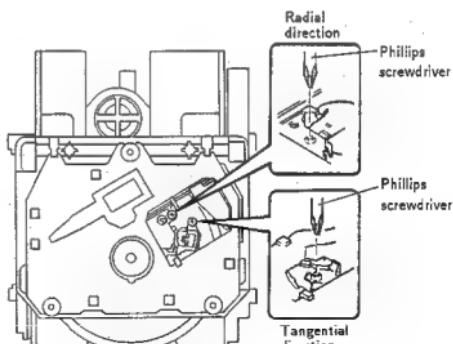


Figure 4



Adjustment locations

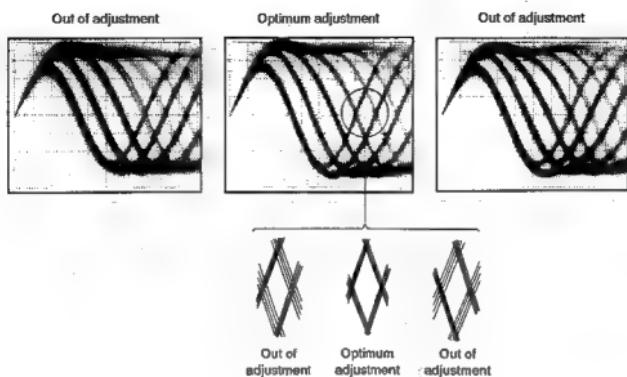


Figure 5 Eye pattern

## 5. RF Level Adjustment

● Objective	To optimize the playback RF signal amplitude		
● Symptom when out of adjustment	No play or no search		
● Measurement instrument connections	Connect the oscilloscope to TPI, Pin 1 (RF).  [Settings]    50 mV/division 10 ms/division AC mode	● Player state  ● Adjustment location  ● Disc	Test mode, play  VR1(laser power)  YEDS-7
<b>[Procedure]</b>			
<ol style="list-style-type: none"> <li>Move the pickup to midway across the disc (<math>R=35</math> mm) with the MANUAL SEARCH FWD <math>\triangleright\triangleright</math> or REV <math>\triangleleft\triangleleft</math> key, then press the PROGRAM key, then the PLAY <math>\triangleright</math> key in that order to close the respective servos and put the player into play mode.</li> <li>Adjust VR1 (laser power) so that the RF signal amplitude is <math>1.2 \text{ Vp-p} \pm 0.1 \text{ V}</math>.</li> </ol>			

## 6. Focus Servo Loop Gain Adjustment

● Objective	To optimize the focus servo loop gain.		
● Symptom when out of adjustment	Playback does not start or focus actuator noisy.		
● Measurement instrument connections	See figure 6. [Settings] CH1                    CH2 20 mV/division    5 mV/division X-Y mode	● Player state Test mode, play  ● Adjustment location VR152 (FCS. GAN)  ● Disc YEDS-7	

### [Procedure]

1. Set the AF generator output to 1.2 kHz and 1 Vp-p.
2. Press the MANUAL SEARCH FWD  $\gg$  or REV  $\ll$  key to move the pickup to halfway across the disc ( $R=35$  mm), then press the PROGRAM key, the PLAY  $\triangleright$  key, then the PAUSE  $\|\!$  key in that order to close the corresponding servos and put the player into play mode.
3. Adjust VR152 (FCS. GAN) so that the Lissajous waveform is symmetrical about the X axis and the Y axis.

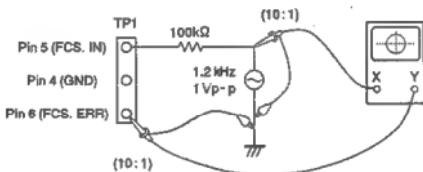
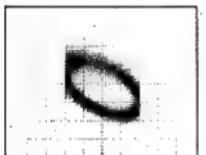
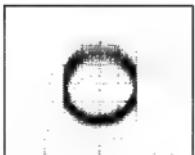


Figure 6

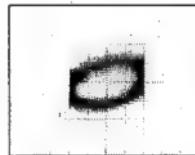
### Focus Gain Adjustment



Higher gain



Optimum gain



Lower gain

## 7. Tracking Servo Loop Gain Adjustment

● Objective	To optimize the tracking servo loop gain.		
● Symptom when out of adjustment	Playback does not start, during searches the actuator is noisy, or tracks are skipped.		
● Measurement instrument connections	<p>See Figure 7.</p> <p>[Settings]            CH1                    CH2            50 mV/division    50 mV/division            X - Y mode</p>	<ul style="list-style-type: none"> <li>● Player state</li> <li>● Adjustment location</li> <li>● Disc</li> </ul>	Test mode, play VR151 (TRK. GAN) YEDS-7

### [Procedure]

1. Set the AF generator output to 1.2 kHz and 2 Vp-p.
2. Press the MANUAL SEARCH FWD  $\triangleright\triangleright$  or REV  $\triangleleft\triangleleft$  key to move the pickup to halfway across the disc ( $R=35$  mm), then press the PROGRAM key, the PLAY  $\triangleright$  key, then the PAUSE  $\|\|$  key in that order to close the corresponding servos and put the player into play mode.
3. Adjust VR151 (TRK. GAN) so that the Lissajous waveform is symmetrical about the X axis and the Y axis.

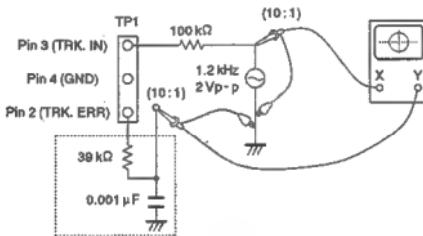
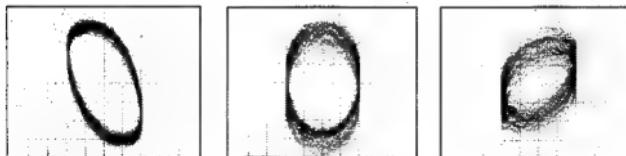


Figure 7

### Tracking Gain Adjustment



## 8. Focus Error Signal (Focus S Curve) Verification

● Objective	To judge whether the pickup is ok or not by observing the focus error signal. The pickup is judged from the amplitude of the tracking error signal (as discussed in the section on adjusting the tracking error balance) and the waveform for the focus error signal.		
● Symptom when out of adjustment			
● Measurement instrument connections	Connect the oscilloscope to TPI, Pin 6 (FCS. ERR).  [Settings] 100 mV/division 5 ms/division. DC mode	● Player state  ● Adjustment location  ● Disc	Test mode, stop  None  YEDS-7

### [Procedure]

1. Connect TPI Pin 5 to ground.
2. Mount the disc.
3. While watching the oscilloscope screen, press the PROGRAM key and observe the waveform in Figure 8 for a moment. Verify that the amplitude is at least  $2.5 \text{ Vp-p}$  and that the positive and negative amplitude are about equal. Since the waveform is only output for a moment when the PROGRAM key is pressed, press this key over and over until you have checked the waveform.

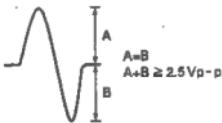


Figure 8

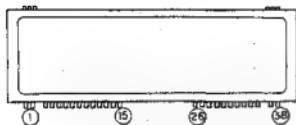
### [Judging the pickup]

Do not judge the pickup until all the adjustments have been made correctly. In the following cases, there may be something wrong with the pickup.

1. The tracking error signal amplitude is extremely small (less than  $2 \text{ Vp-p}$ ).
2. The focus error signal amplitude is extremely small (less than  $2.5 \text{ Vp-p}$ ).
3. The positive and negative amplitudes of the focus error signal are extremely asymmetrical (2 : 1 ratio or more).
4. The RF signal is too small (less than  $0.8 \text{ Vp-p}$ ) and even if VRI (laser power) is adjusted, the RF signal can not be brought up to the standard level.

## 7. FL INFORMATION

### EXTERNAL VIEWS



### DISPLAY PATTERN ANODE GRID ASSIGNMENT



### ANODE GRID ASSIGNMENT AND PIN ASSIGNMENT

	G1	G2	G3	G4	G5	G6	G7	G8	G9	G10
a	a	a	a	a	a	a	a	/	►	a
b	b	b	b	b	b	b	b	SCAN	■	b
c	c	c	c	c	c	c	c	►OPEN	54	c
d	d	d	d	d	d	d	d	reserving	46	d
e	e	e	e	e	e	e	e	►(single)	60	e
f	f	f	f	f	f	f	f	►(scan)	90	f
g	g	g	g	g	g	g	g	SINGLE	74	g
h	/	DISPLAY	OFF	FADER	1 ►	REPEAT	AUTO SPACE	► OFF	TIME FADE	/
i	1	2	4	5	7	8	10	►(ALL)	AUTO	/
j	TRACK	3	STEP	6	/	9	PGM	ALL	EDIT	/
k	/	12	INDEX	15	MIN	18	►(RND)	PEAK SEARCH	SEC	/
l	11	13	14	16	17	19	DEL	RND	COMPU	/



### PIN ASSIGNMENT

Pin No.	1	2	3	4	5	6	7	8	9	10	11	12	13
Assignment	F	F	NP	e	f	g	■	a	b	c	d	i	j
Pin No.	14	15	16	17	18	19	20	21	22	23	24	25	26
Assignment	k	l	NP	NP	NP	NP	GJ						
Pin No.	27	28	29	30	31	32	33	34	35	36	37	38	
Assignment	G2	G3	G4	G5	G6	G7	G8	G9	G10	NP	F	F	

F : Filament

G1-G10 : Grid

a-l : Anode

NP : No pin

## 8. FOR PD-8700/HEM, HB, SD AND PD-8700-S/HEWM TYPES

### NOTES :

- Parts without part number cannot be supplied.
- Parts marked by “◎” are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.
- The △ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.

### CONTRAST OF MISCELLANEOUS PARTS

The PD-8700/HEM, HB, SD and PD-8700-S/HEWM types are the same as the PD-31/KU type with the exception of the following sections.

Mark	Symbol & Description	Part No.					Remarks
		PD-31/KU	PD-8700 /HEM	PD-8700 /HB	PD-8700 /SD	PD-8700-S /HEWM	
△◎	Mother board assembly	PWM1448	PWM1449	PWM1449	PWM1449	PWM1449	*1
	S trans board assembly	Non supply	Non supply	Non supply	Non supply	Non supply	*2
△	A trans board assembly	Non supply	Non supply	Non supply	Non supply	Non supply	*2
△	AC power cord	PDG1015	PDG1003	PDG1036	PDG1013	PDG1003	
△	Power transformer S(AC120V)	PTT1179					
△	Power transformer S(AC220,240V)		PTT1178	PTT1178		PTT1178	
△	Power transformer S (AC110,120-127, 220, 240V)				PTT1181		
△	Power transformer A(AC120V)	PTT1183					
△	Power transformer A(AC220,240V)		PTT1182	PTT1182		PTT1182	
△	Power transformer A (AC110,120-127, 220, 240V)				PTT1185		
△	Voltage selector						
△	Strain relief	CM-22C	CM-22B	CM-22B	CM-22B	CM-22B	
	Cord with plug (mini plug)	PDE-319					
	Front panel assembly	PEA1164	PEA1132	PEA1132	PEA1132	PEA1152	
	Control panel	PNW1948	PNW1948	PNW1948	PNW1948	PNW2009	
	Power button	PAC1569	PAC1569	PAC1569	PAC1569	PAC1598	
	Select button	PAC1570	PAC1570	PAC1570	PAC1570	PAC1591	
	Play button	PAC1571	PAC1571	PAC1571	PAC1571	PAC1582	
	Search button	PAC1572	PAC1572	PAC1572	PAC1572	PAC1593	
	Headphone knob S					PAC1597	
	Knob C	RAC1608	RAC1608	RAC1608	RAC1608		
	Slide knob	RAC1428	RAC1428	RAC1428	RAC1428	PAC1599	
	Tray panel	PNW2025	PNW1949	PNW1949	PNW1949	PNW2011	
	Display window	PAM1503	PAM1488	PAM1488	PAM1503	PAM1488	
	Bonnet	PYY1148	PYY1148	PYY1148	PYY1148	PYY1154	
	CD packing case	PHG1679	PHG1678	PHG1678	PHG1678	PHG1680	For packing

\*1 : As to the parts list of the Mother board assembly, refer to page 12.

\*2 : These assemblies are the same as the PD-31/KU type for the service supply parts.

Mark	Symbol & Description	Part No.					Remarks
		PD-31/KU	PD-8700 /HEM	PD-8700 /HB	PD-8700 /SD	PD-8700-S /HEWM	
	Operating instructions(English)	PRB1151			PRB1139	PRB1139	
	Operating instructions (English/French)		PRE1142				
	Operating instructions (German/Italian/Dutch/Swedish /Spanish/Portuguese)			PRF1042			PRF1042
	Operating instructions (Spanish)				PRC1035		

## 9. FOR PD-7700/KU, KC, HEM, HB, SD, HPW AND PD-7700-S/HEWM TYPES

### 9.1 CONTRAST OF MISCELLANEOUS PARTS

NOTES :

- Parts without part number cannot be supplied.
- Parts marked by “●” are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.
- The ▲ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.

The PD-7700/KU, KC, HEM, HB, SD, HPW and PD-7700-S/HEWM types are the same as the PD-31/KU type with the exception of the following sections.

Mark	Symbol & Description	Part No.								Remarks
		PD-31/KU	PD-7700 /KU	PD-7700 /KC	PD-7700 /HEM	PD-7700 /HB	PD-7700 /SD	PD-7700 /HPW	PD-7700-S /HEWM	
▲ ●	Mother board assembly	PWN1446	PWM1444	PWM1444	PWM1445	PWM1445	PWM1447	PWM1444	PWM1445	
▲ ●	Audio board assembly	PWN2118	.....	.....	.....	.....	.....	.....	.....	
▲ ●	S trans board assembly	Non supply	.....	.....	.....	.....	.....	.....	.....	
▲ ●	A trans board assembly	Non supply	.....	.....	.....	.....	.....	.....	.....	
▲ ●	Oversize board assembly	PWN2212	PWZ2211	PWZ2211	PWZ2211	PWZ2211	PWZ2211	PWZ2211	PWZ2211	
▲ ●	SW board assembly	Non supply	Non supply	Non supply	Non supply	Non supply	Non supply	Non supply	Non supply	
▲ ●	Headphone board assembly	Non supply	Non supply	Non supply	Non supply	Non supply	Non supply	Non supply	Non supply	
▲ ●	Jack board assembly	Non supply	.....	.....	.....	.....	.....	.....	.....	
▲	Voltage selector	.....	.....	.....	.....	.....	PSB1002	.....	.....	
▲	Power transformer S(AC120V)	PTT1179	PTT1179	PTT1179	PTT1178	PTT1178	PTT1178	PTT1178	PTT1178	
▲	Power transformer S(AC220 240V)	.....	.....	.....	.....	.....	PTT1178	PTT1178	PTT1178	
▲	Power transformer S(AC110, 120-127, 220, 240V)	.....	.....	.....	.....	.....	PTT1181	.....	.....	
▲	Power transformer A(AC120V)	PTT1183	.....	.....	.....	.....	.....	.....	.....	
▲	AC power cord	PDG1015	PDG1015	PDG1003	PDG1036	PDG1036	PDG1013	PDG1006	PDG1003	
▲	Scrin retainer	CM-22C	CM-22C	CM-22C	CM-22B	CM-22B	CM-22B	CM-22B	CM-22B	
▲	Front panel assembly	PEA1164	PEA1164	PEA1133	PEA1133	PEA1133	PEA1133	PEA1133	PEA1133	
▲	Control panel	PNW1948	PNW1948	PNW1948	PNW1948	PNW1948	PNW1948	PNW1948	PNW2009	
	Power button	PAC1569	PAC1569	PAC1569	PAC1569	PAC1569	PAC1569	PAC1569	PAC1590	
	Select button	PAC1570	PAC1570	PAC1570	PAC1570	PAC1570	PAC1570	PAC1570	PAC1591	
	Play button	PAC1571	PAC1571	PAC1571	PAC1571	PAC1571	PAC1571	PAC1571	PAC1592	
	Search button	PAC1572	.....	.....	.....	.....	.....	.....	.....	
	Headphone knob	.....	PAC1600	PAC1600	PAC1600	PAC1600	PAC1600	PAC1600	PAC1601	
	Slide knob	RAC1428	.....	.....	.....	.....	.....	.....	.....	
	Knob C	RAC1608	.....	.....	.....	.....	.....	.....	.....	
	Display window	PAM1503	PAM1503	PAM1503	PAM1488	PAM1488	PAM1503	PAM1503	PAM1488	
	Cord with plug (mini plug)	PDE-319	.....	.....	.....	.....	.....	.....	.....	
	Tray panel	PWN2005	PWN1049	PWN1049	PWN1049	PWN1049	PWN1049	PWN1049	PWN2011	
	Bonnet	PYY1148	PYY1148	PYY1148	PYY1148	PYY1148	PYY1148	PYY1148	PYY1154	
	CD packing case	PHG1679	PHG1683	PHG1683	PHG1683	PHG1683	PHG1681	PHG1681	PHG1682	
	Stopper	PNM1134	PNM1070	PNM1070	PNM070	PNM1070	PNM1070	PNM1070	PNM1070	
	Insulator	PWN2020	VNK1095	VNK1095	VNK1095	VNK1095	VNK1095	VNK1095	VNK1095	
	Cord clammer	RNH-184	.....	.....	.....	.....	.....	.....	.....	
	BIA/S lens	RNH1674	.....	.....	.....	.....	.....	.....	.....	
	Operating instructions(English)	PRB1151	PRB1139	PRE1142	PRE1142	PRB1139	PRB1139	PRB1139	.....	
	Operating instructions(English/French)	.....	.....	.....	.....	.....	.....	.....	.....	
	Operating instructions (German/Italian/Dutch/Swedish/Spanish/Portuguese)	.....	.....	.....	PRF1042	.....	.....	.....	PRF1042	
	Operating instructions(Spanish)	.....	.....	.....	PRC1035	.....	.....	.....	.....	

For Packing

## 9.2 P.C.B.'s PARTS LIST

### NOTES:

- Parts without part number cannot be supplied.
- Parts marked by "●" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.
- The △ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- When ordering resistors, first convert resistance values into code form as shown in the following examples.

Ex.1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5%, and K = 10%).

560Ω 56 × 10<sup>3</sup> 561 ..... RD1/4PS[5][6][J]

47kΩ 47 × 10<sup>3</sup> 473 ..... RD1/4PS[4][7][S]

0.5Ω 0R5 ..... RD2H[0][R][5]K

1Ω 010 ..... RD1P[0][1]0K

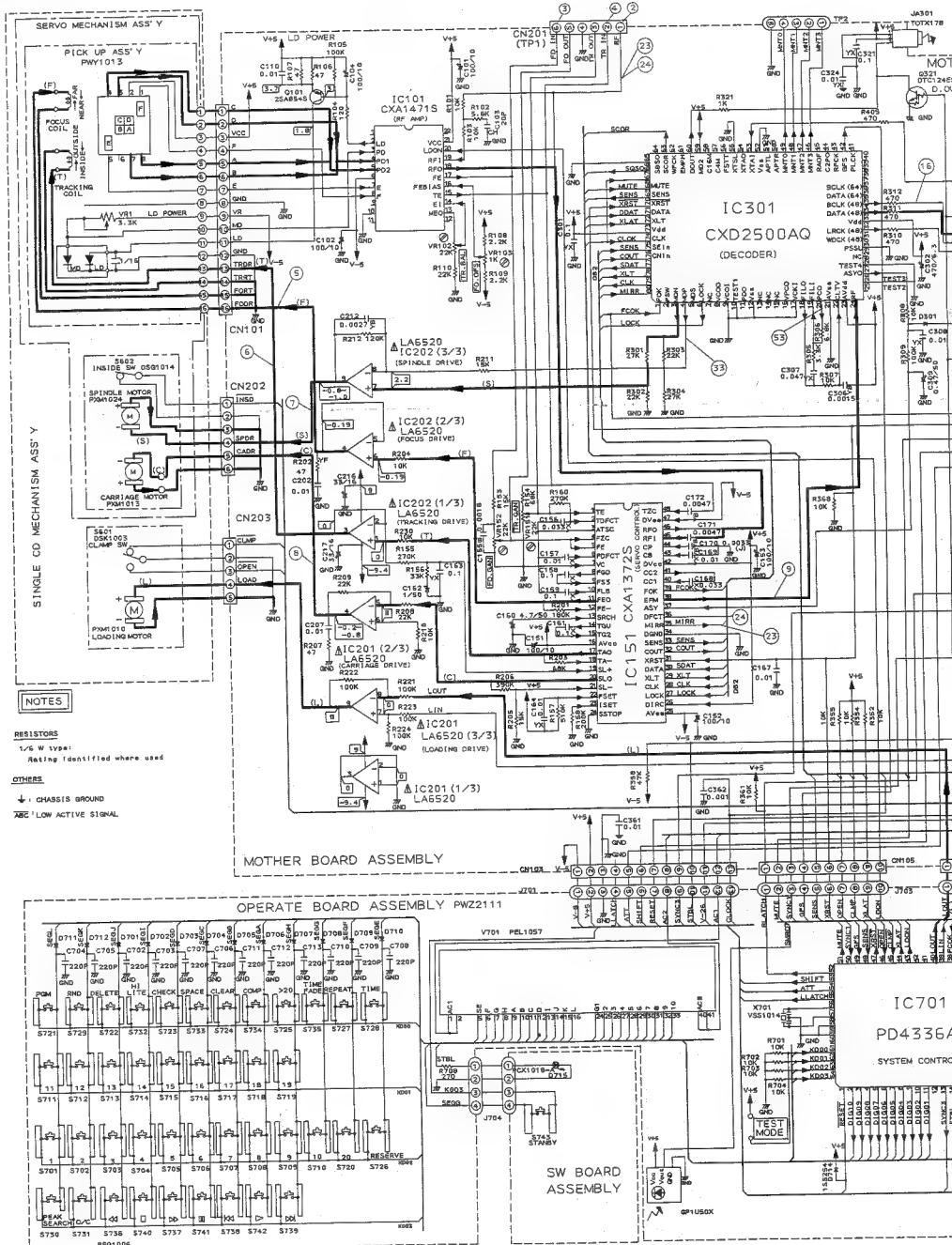
Ex.2 When there are 3 effective digits (such as in high precision metal film resistors).

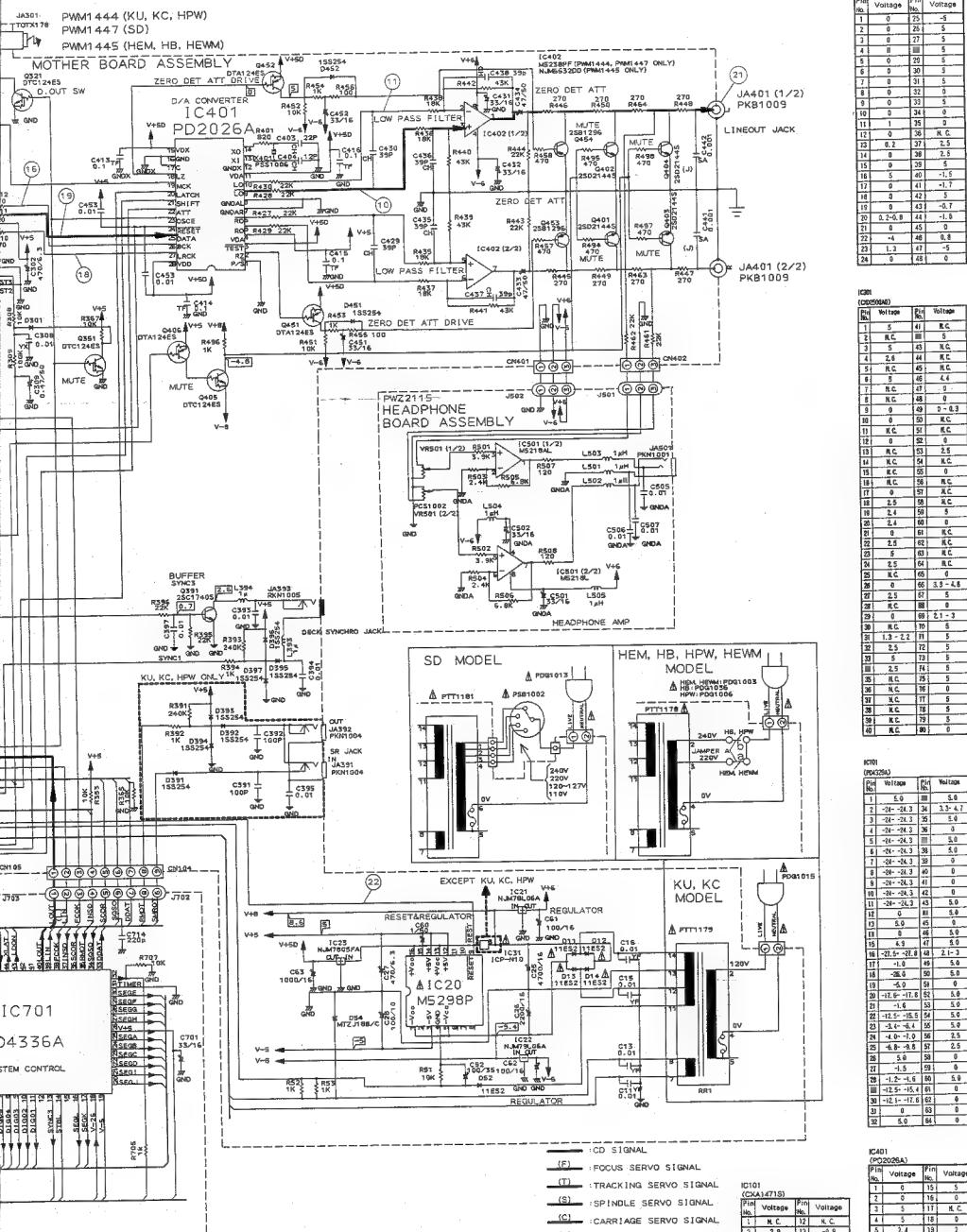
5.62kΩ 562 × 10<sup>3</sup> 5621 ..... RD1/4SR[5][6][2][F]

Mark No.	Description	Parts No.	Mark No.	Description	Parts No.
<b>① MOTHER BOARD ASSEMBLY</b>					
(PWM1444: PD-7700/KU, KC and HPW types)			L393	AXIAL INDUCTOR	LAU010K
(PWM1445: PD-7700/HEM, HB and			L394	AXIAL INDUCTOR	LAU010K
PD-7700-S/HEWM types)					
(PWM1447: PD-7700/SD type)					
<b>SEMICONDUCTORS</b>					
△ IC20 REGULATOR IC	M5298P	C11, C13 CERAMIC CAPACITOR	CKCYF108Z50		
IC21 REGULATOR IC	NJM78L05A	C15, C16 CERAMIC CAPACITOR	CKCYF108Z60		
IC22 REGULATOR IC	NJM78L06A	C25 ELECTROLYTIC CAPACIT	CEAS472M18		
IC23 REGULATOR IC	NJM7805FA	C26 ELECTR.CAPACITOR	CEAS222M16		
△ IC31 IC(PWM1445, PWM1447 only)	ICP-N10	C27 ELECTROLYTIC CAPACIT	CEAS471M6R3		
IC101 PRE AMP IC	CXA1471S	C28 ELECTR.CAPACITOR	CEAS101M10		
IC151 SERVO IC	CXA1372S	C52 ELECTR.CAPACITOR	CEAS101M85		
△ IC201,IC202 POWER OP-AMP,IC	LA6520	C50 ELECTR.CAPACITOR	CEAS010M50		
IC301 EFM DEMODULATION IC	CXD2500AQ	C61, C62 ELECTR.CAPACITOR	CEAS101M16		
IC401 D/A CONVERTER,IC	PD2026A	C63 ELECTR.CAPACITOR	CEAS102M16		
IC402 OP-AMP IC	M5238PP	C101, C102 ELECTR.CAPACITOR	CEAS101M10		
(PWM1444, PWM1447 only)		C103 CERAMIC CAPACITOR	CCCHC200J50		
IC402 OP-AMP IC	NJM5532DD	C104 ELECTR.CAPACITOR	CEAS101M10		
(PWM1445 only)		C110 CERAMIC CAPACITOR	CKCYF108Z60		
Q101 TRANSISTOR	2SA854S	C151-C153 ELECTR.CAPACITOR	CEAS101M10		
Q321,Q351 TRANSISTOR	DTC124ES	C155 CERAMIC CAPACITOR	CKCYB152K50		
Q391 TRANSISTOR	2SC1740S	C156 CERAMIC CAPACITOR	CGCYX333K25		
Q401-Q404 TRANSISTOR	2SD2144S	C157 CERAMIC CAPACITOR	CGCYX103K25		
Q405 TRANSISTOR	DTC124ES	C158,C189 CERAMIC CAPACITOR	CGCYX104K25		
Q406 TRANSISTOR	DTA124ES	C160 ELECTR.CAPACITOR	CEAS4R7M80		
Q451,Q452 TRANSISTOR	DTA124ES	C161 CERAMIC CAPACITOR	CGCYX104K25		
Q453,Q454 TRANSISTOR	2SB1296	C162 ELECTR.CAPACITOR	CEAS010M50		
△ D11-D14,D52 DIODE	11ES2	C163 CERAMIC CAPACITOR	CGCYX104K25		
D54 ZENNER DIODE	MTZJ18B	C164 CERAMIC CAPACITOR	CGCYX103K25		
D301 DIODE	1SS254	C167 CERAMIC CAPACITOR	CKYF108Z50		
D391-D394 DIODE(PWM1444 only)	1SS254	C168 CERAMIC CAPACITOR	CGCYX333K25		
D395-D397 DIODE	1SS254	C169 CERAMIC CAPACITOR	CGCYX103K25		
D451,D452 DIODE	1SS254	C170 CERAMIC CAPACITOR	CKYB332K50		
		C171,C172 CERAMIC CAPACITOR	CKYB472K50		
		C202,C207 CERAMIC CAPACITOR	CKYF108Z50		

Mark	No.	Description	Parts No.	Mark	No.	Description	Parts No.
C212	CERAMIC CAPACITOR	CKCYB272K50		<b>● OPERATE BOARD ASSEMBLY (PWZ2111)</b>			
C216,C217	ELECTR.CAPACITOR	CEAS330M16		<b>SEMICONDUCTORS</b>			
C301	CERAMIC CAPACITOR	CGCYX104K25		I701	MICROCOMPUTER,IC	PD4336A	
C302	ELECTROLYTIC CAPACIT	CEAS471M6R3		D701-D714	DIODE	ISS254	
C306	CERAMIC CAPACITOR	CKYB152K50		<b>SWITCHES</b>			
C307	CERAMIC CAPACITOR	CGCYX473K25	S701-S742 SWITCH	PSC1006			
C308	CERAMIC CAPACITOR	CGCYX103K25	1-20, PGM, DELETE, CHECK, CLEAR, >20, RESERVE, REPEAT, TIME, RND, PEAK SEARCH, O/L, HI LITE SCAN, AUTO SPACE, COMP, TIME FADE, 44, 10, 14, 10, STOP(□), PLAY(>)				
C309	ELECTR.CAPACITOR	CEAS47M50					
C321	CERAMIC CAPACITOR	CGCYX104K25	<b>CAPACITORS</b>				
C324	CERAMIC CAPACITOR	CKCYF103Z50	C701 ELECTR.CAPACITOR	CEAS330M16			
C361	CERAMIC CAPACITOR	CKCYF103Z50	C702-C714 AXIAL CAPACITOR	CKPUBYB221K50			
C362	CERAMIC CAPACITOR	CKYB102K50					
C391,C392	CERAMIC CAPACITOR (PWM1444 only)	OCSSL10J50	<b>RESISTORS</b>				
C393,C394	CERAMIC CAPACITOR	CKCYF103Z50	All resistors	RD1/6PM	□ □		
C395	CERAMIC CAPACITOR (PWM1444 only)	CKCYF103Z50					
C397	CERAMIC CAPACITOR	CKCYF103Z50	<b>OTHERS</b>				
C403	CERAMIC CAPACITOR	CCCCH220J50	V701 FL INDICATOR TUBE	PEL1057			
C404	CERAMIC CAPACITOR	CCCCH120J50	X701 CERAMIC RESONATOR	VSS1014			
C413-C416	AUDIO FILM CAPACITOR	CFTXA104J50	PHOTO SENSOR UNIT	GPU150X			
C429,C430	CERAMIC CAPACITOR	CCCCH380J50	<b>SW BOARD ASSEMBLY</b>				
C431,C432	ELECTR.CAPACITOR	CEAS330M16	<b>SEMICONDUCTORS</b>				
C433,C434	ELECTR.CAPACITOR	CEAS470M50	D715 LED	PCX1018			
C435-C438	CERAMIC CAPACITOR	CCCCH380J50	<b>SWITCHES</b>				
C441,C442	PL.STYRENE CAPACITOR	CQSA102J50	S743 SWITCH (ON/STN BY)	PSG1006			
C451,C452	ELECTR.CAPACITOR	CEAS330M16	<b>HEADPHONE BOARD ASSEMBLY</b>				
C453	CERAMIC CAPACITOR	CKCYF103Z50	<b>SEMICONDUCTORS</b>				
<b>RESISTORS</b>			I501 OP-AMP,IC	M5218AL			
VR102	VR	VRTB6VS223	<b>COILS</b>				
VR103	VR	VRTB6VS102	L501-L505 AXIAL INDUCTOR	LAU010K			
VR151	VR	VRTB6VS223	<b>CAPACITORS</b>				
VR152	VR	VRTB6VS223	C501,C502 ELECTR.CAPACITOR	CEAS330M16			
R391	CARBON FILM RESISTOR (PWM1444 only)	RD1/6PM244J	C505-C507 CERAMIC CAPACITOR	CKCYF103Z50			
R392	CARBON FILM RESISTOR (PWM1444 only)	RD1/6PM102J	<b>RESISTORS</b>				
Other resistors		RD1/6PM	VR501 VARIABLE RESISTOR	PCS1002			
<b>OTHERS</b>			Other resistors	RD1/6PM	□ □		
CN101	CONNECTOR	52045-1610	<b>OTHERS</b>				
JA801	OPTICAL OUTPUT JACK	TOTX178	J4401 JACK	PKN1003			
JA391	JACK/12V(PWM1444 only)	PKN1004					
JA392	JACK/12V(PWM1444 only)	PKN1004					
JA393	JACK(mini)	PKN1006					
JA401	JACK (2P)	PKB1006					
X401	XTAL RES (OSC)	PSS1006					

#### 9.4 SCHEMATIC DIAGRAM



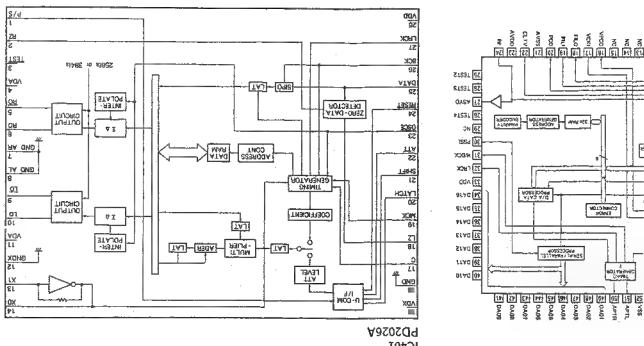
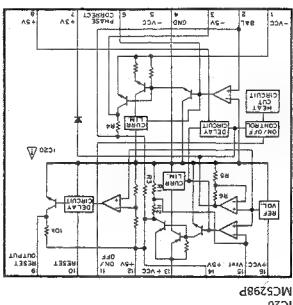


- (F) : FOCUS SERVO SIGNAL
- (T) : TRACKING SERVO SIGNAL
- (S) : SPINDLE SERVO SIGNAL
- (C) : CARRIAGE SERVO SIGNAL
- (L) : LOADING SERVO SIGNAL

IC151 (KA1372S)	Voltage	Pin No	Voltage
1	0	25	-5
2	0	25	5
3	0	27	5
4	11	16	0
5	0	26	0
6	0	20	0
7	0	21	5
8	0	32	0
9	0	33	0
10	0	34	0
11	1	25	0
12	0	36	0
13	0.2	37	2.2
14	0	38	0
15	0	39	5
16	5	40	0
17	0	41	-1.7
18	0	42	0
19	0	43	-0.7
20	0.2-0.8	44	-1.8
21	0	45	0
22	-4	46	9.5
23	0	47	0
24	0	48	0

PN#	Voltage	Pt No.	Volts
1	-24	1	5.0
1	-24 + -24.3	24	3.3
1	-24 + -24.3	25	5.0
4	-24 + -24.3	36	0
5	-24 + -24.3	37	0
6	-24 + -24.3	38	0
7	-24 + -24.3	39	0
8	-24 + -24.3	40	0
9	-24 + -24.3	41	0
10	-24 + -24.3	42	0
11	-24 + -24.3	43	5.0
12	0	44	0
13	5.0	45	0
14	5.0	46	0
15	4.3	47	5.0
16	-21.5 + -21.6	48	2.1
17	-1.0	49	5.0
18	-36.0	50	5.0
19	-5.0	51	5.0
20	-1.0	52	5.0
21	-1.0	53	5.0
22	-12.5 + -12.6	54	5.0
23	-1.0 + -1.1	55	5.0
24	-1.0 + -1.0	56	2.0
25	-6.0 + -6.0	57	2.0
26	-1.0 + -1.0	58	2.0
27	-1.0 + -1.0	59	2.0
28	-1.0 + -1.0	60	2.0
29	-12.5 + -12.6	61	0
30	-12 + -17.6	62	0
31	0	63	0

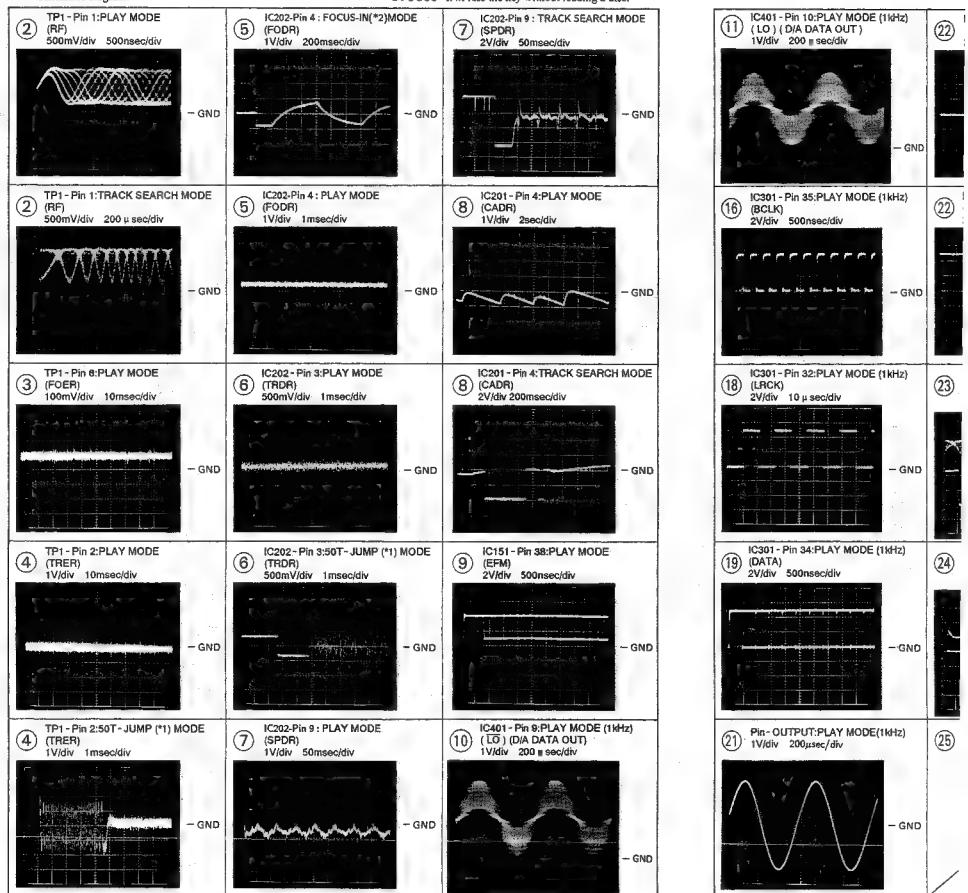
Pin No.	Voltage	Pin No.	Voltage
1	0	15	5
2	0	16	4
3	5	11	N.C.
4	1	18	0
5	2.4	19	18
6	2.6	20	5
7	0	21	5
8	0	22	5
9	2.6	23	5
10	2.2	24	5
11	5	25	2.4
12	0	26	2.4
13	2.4	27	2.4
14	2.4	28	5

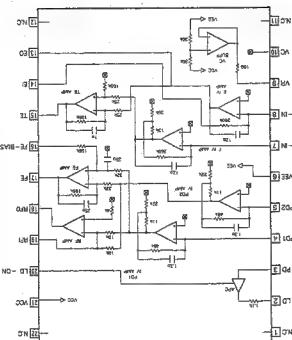
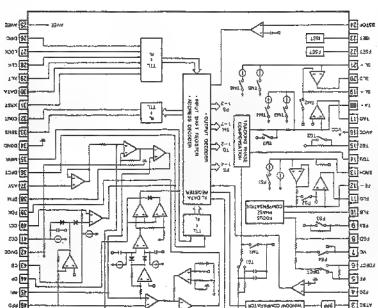
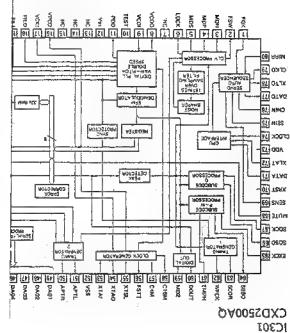


### 9.3 WAVEFORMS

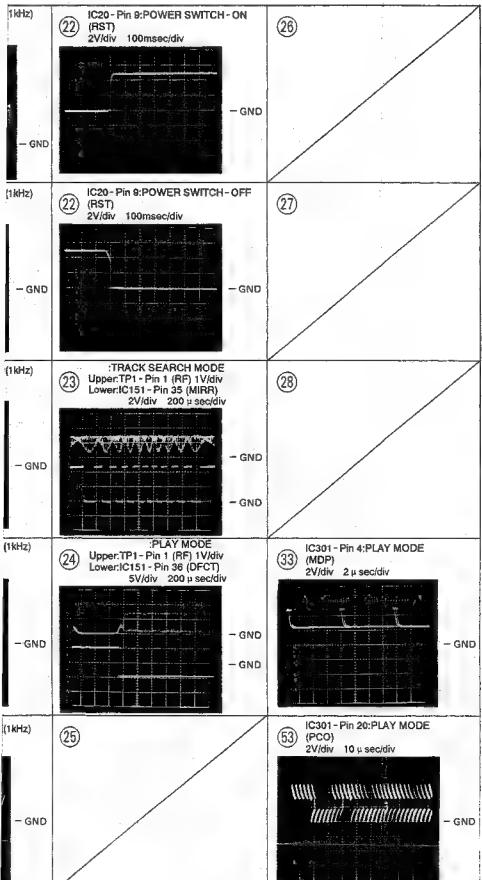
Note: The encircled numbers denote measuring in the schematic diagram.

\*1 50T-JUMP: After switching to the pause mode, press the manual search key.





### • IC BLOCK DIAGRAM



#### 1.RESISTORS :

Indicated in  $\Omega$ , 1/4W, 1/W and 1/W, ±5% tolerance unless otherwise noted.  
k : kΩ M : MΩ (F) : ±1% (G) : ±2% (K) : ±10% (M) : ±20% tolerance.

#### 2.CAPACITORS :

Indicated in capacity ( $\mu\text{F}$ ) /voltage(V) unless otherwise noted p : pF. Indication without voltage is 50V except electrolytic capacitor.

#### 3.VOLTAGE, CURRENT :

$\square$  : DC voltage (V) at play state.  
 $\text{CmA}$  : DC current at play state.  
Value in  $(\ )$  is DC current at stop state.

#### 4.OTHERS :

♦ : Signal route.  
◎ : Adjusting point.  
The Δ symbol on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.  
※ marked capacitors and resistors have parts numbers.

This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

#### 5.SWITCHES : (The underline indicates the switch position)

SWITCH BOARD ASSEMBLY

S741 : POWER ON/OFF

#### OPERATE BOARD ASSEMBLY

S701 : 1	ST33 : CHECK
S742 : 2	ST24 : CLEAR
S703 : 3	S725 : > 20
S704 : 4	S726 : RESERVE
S705 : 5	S727 : REPEAT
S706 : 6	S728 : TIME
S707 : 7	S729 : RND
S708 : 8	S730 : PEAK SEARCH
S709 : 9	S731 : O/L
S710 : 10	S732 : HI LITE SCAN
S711 : 11	S733 : AUTO SPACE
S712 : 12	S742 : CPU
S713 : 13	S735 : TIME FADE ] EDIT
S714 : 14	S736 : [ ] MANUAL SEARCH
S715 : 15	S737 : [ ] ST
S716 : 16	S738 : [ ] TRACK SEARCH
S717 : 17	S739 : [ ]
S718 : 18	S740 : STOP ( )
S719 : 19	S741 : PAUSE ( )
S720 : 20	S742 : PLAY ( )
S721 : PGM	S743 : ON/STN BY
S722 : DELETE	

#### Line Voltage Selection (For HB,HEM, HPW and HEWM types)

Line voltage can be changed with the following steps.

1. Disconnect the AC power cord.
2. Remove the top cover.
3. Change the position of the jumper wire A as follows

Voltage	Jumper wire A position
220V	a
240V	b

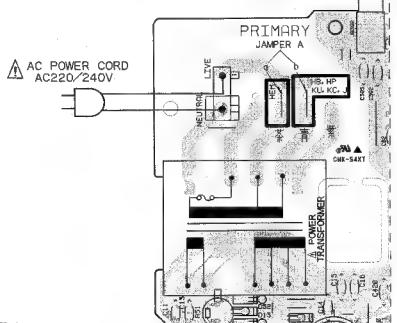
4. Stick the line voltage label on the rear panel.

Parts No.	Description
AXX-193	220V label
AXX-192	240V label

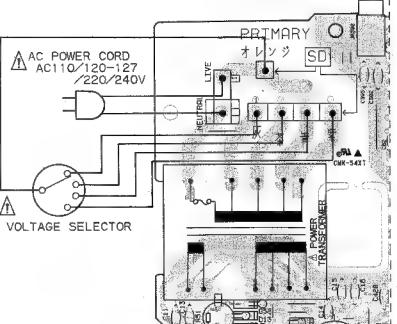
9.5 P.C.BORDS CONNECTION DIAGRAM

A

POWER SUPPLY SECTION FOR HEM,HB,HPW AND HEWM TYPES



C POWER SUPPLY SECTION FOR SD TYPE



1

2

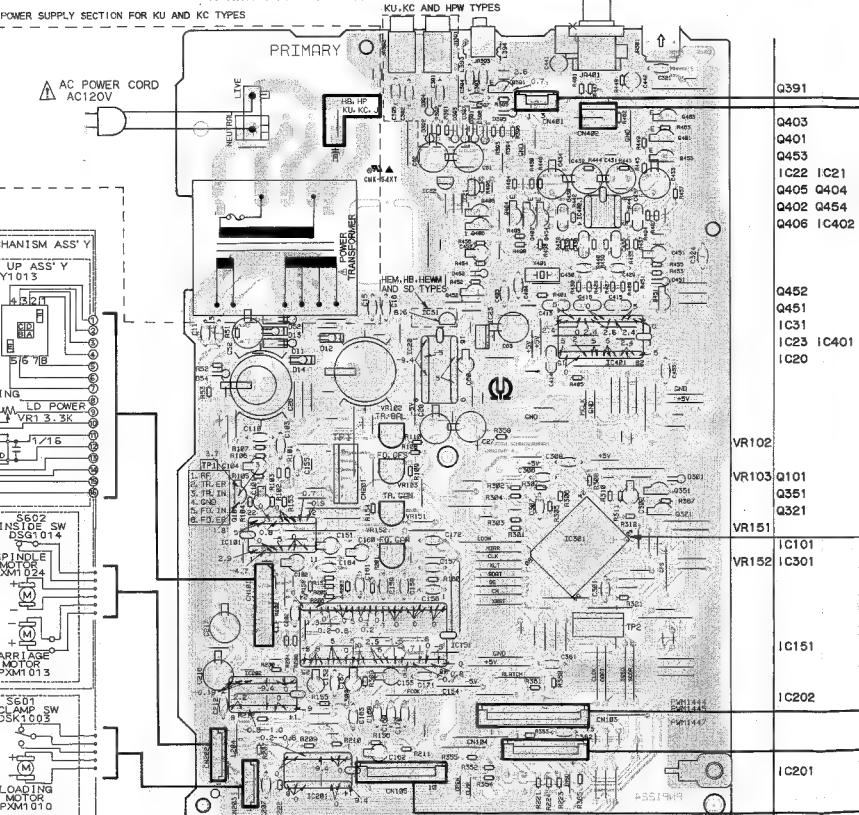
3

4

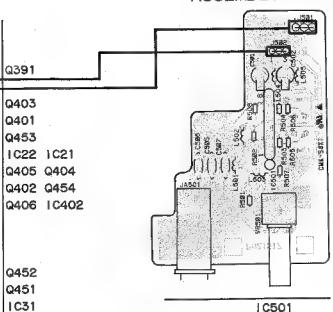
5

6

MOTHER BOARD ASSEMBLY  
(PWM1444:KU,KC AND HPW TYPES)  
(PWM1445:HEM,HB AND HEWM TYPES)  
(PWM1447:SD TYPE)

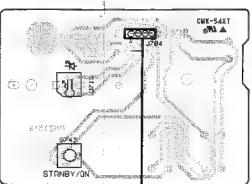


HEADPHONE BOARD ASSEMBLY

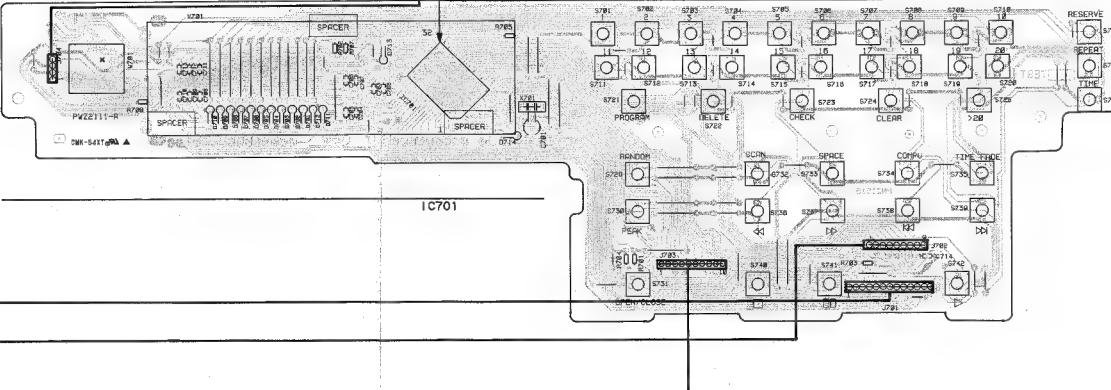


HBM		Bottom	
1	S	24	Bottom
2	K.C.	42	S
3	5	43	K.C.
4	2.6	44	K.C.
5	4.7	45	K.C.
6	5	46	K.C.
7	K.C.	47	0
8	4.7	48	0
9	0	49	0 - 0.3
10	0	50	K.C.
11	K.C.	51	0
12	0	52	0
13	N.C.	53	2.3
14	K.C.	54	K.C.
15	0	55	0
16	K.C.	56	K.C.
17	0	57	N.C.
18	2.5	58	K.C.
19	1.5	59	0
20	2.4	60	0
21	0	61	K.C.
22	1.5	62	K.C.
23	5	63	K.C.
24	2.5	64	K.C.
25	K.C.	65	D
26	0	66	3.3 - 0.5
27	2.5	67	0.5
28	0	68	0
29	0	69	2.1 - 0
30	W.C.	70	5
31	1.3 - 2.2	71	0
32	0.5	72	0
33	0	73	0
34	2.5	74	5
35	K.C.	75	5
36	0	76	0
37	K.C.	77	5
38	K.C.	78	16
39	K.C.	79	5
40	K.C.	80	0

SW BOARD ASSEMBLY



OPERATE BOARD ASSEMBLY (PWZ2111)



P.C.B. pattern diagram indication	Corresponding part symbol	Part name	P.C.B. pattern diagram indication	Corresponding part symbol	Part name
		Transistor			FET
		Diode			Zener diode
		LED			Varactor
		Tact switch			Inductor
		Transformer			Filter

1. This P.C.B. connection diagram is viewed from the parts mounted side.

2. The parts which have been mounted on the board can be replaced with those shown with the corresponding wiring symbols listed in the above table.

3. The terminal marked with shows negative terminal.

4. The diode marked with shows cathode side.

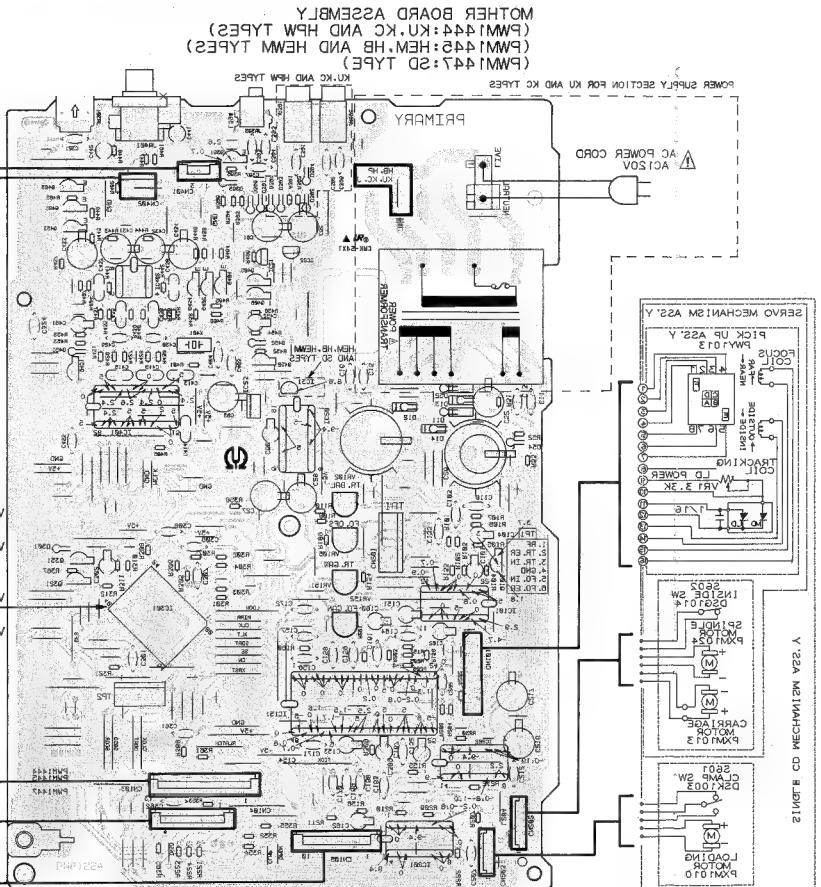
5. The diode marked with shows anode side.

C

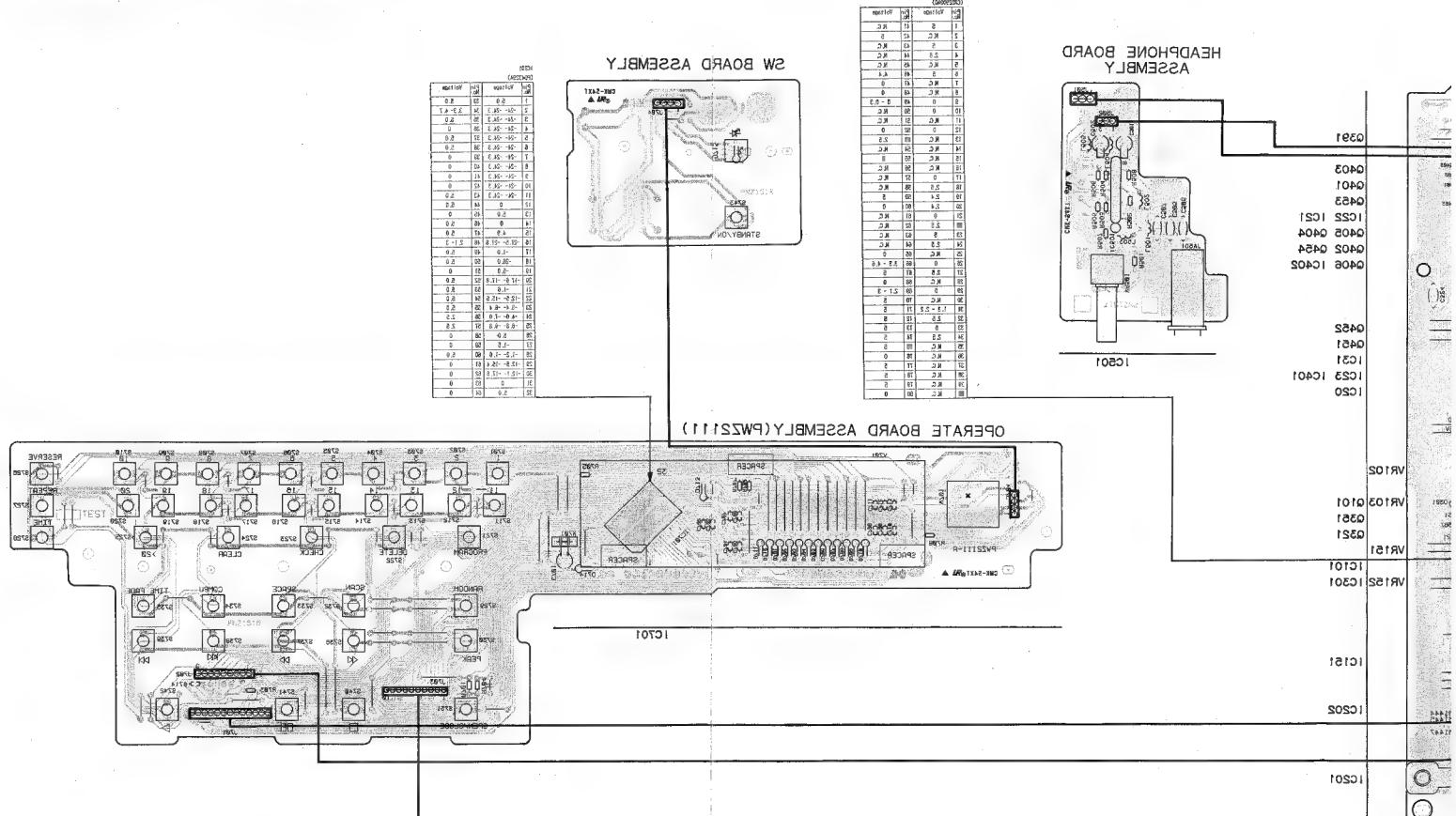
C

D

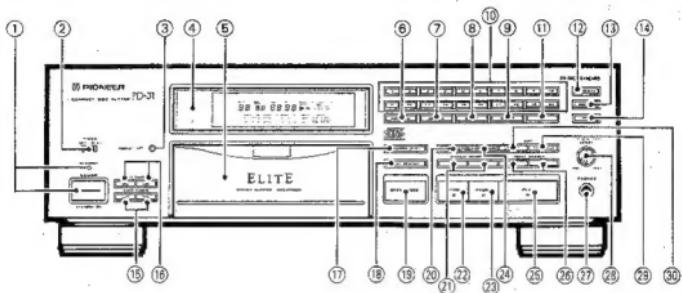
E



This P.C.B. connection diagram is viewed from the foil side.



## 10. PANEL FACILITIES



### FRONT PANEL

#### ① POWER STANDBY/ON switch and indicator

Press this switch to turn the power on. The unit will set to the standby mode and the STANDBY indicator will light.

#### ② TIMER OFF/PLAY switch

#### ③ DISPLAY OFF button

#### ④ Remote sensor

#### ⑤ Disc tray

#### ⑥ PROGRAM button

#### ⑦ DELETE button

#### ⑧ CHECK button

#### ⑨ CLEAR button

#### ⑩ Track number buttons (1-20)

#### ⑪ >20 button

#### ⑫ REVERSE button

#### ⑬ REPEAT button

#### ⑭ TIME button

#### ⑮ AUTO FADER buttons (↔, ↖, ↘)

#### ⑯ INDEX SEARCH buttons (↔, ↖, ↘)

#### ⑰ RANDOM PLAY button

#### ⑱ PEAK SEARCH button

#### ⑲ OPEN/CLOSE button

#### ⑳ HI-LITE SCAN button

#### ㉑ MANUAL SEARCH buttons (◀◀, ▶▶)

#### ㉒ STOP button (■)

#### ㉓ PAUSE button (■■)

#### ㉔ AUTO SPACE button

#### ㉕ PLAY button (▶)

#### ㉖ TRACK SEARCH buttons (◀◀, ▶▶)

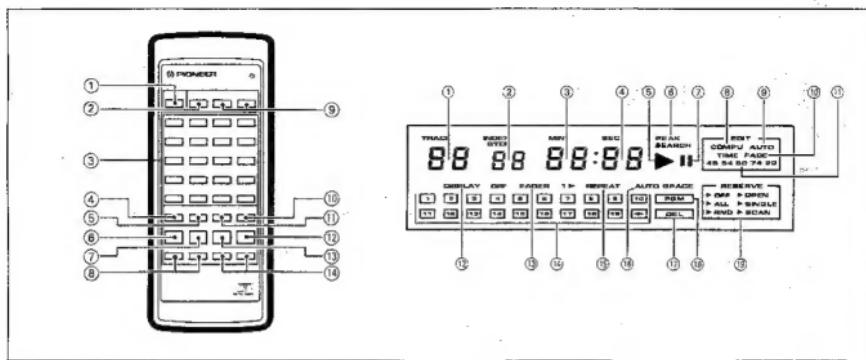
#### ㉗ Headphones jack (PHONES)

#### ㉘ Headphones/line volume control (PHONES/LINE LEVEL)

#### ㉙ TIME FADE EDIT button

#### ㉚ Program edit button (EDIT)

#### (■ COMPU/■■ AUTO)



### REMOTE CONTROL UNIT

Buttons listed here but not accompanied with explanations have the same functions as the corresponding front panel buttons.

- ① POWER button
- ② OPEN/CLOSE button
- ③ Track number buttons (1–20)
- ④ HI-LITE SCAN button
- ⑤ RESERVE button
- ⑥ RANDOM PLAY button
- ⑦ STOP button (■)
- ⑧ Manual search buttons (MANUAL ◀◀, ▶▶)
- ⑨ OUTPUT LEVEL buttons (–, +)
- ⑩ >20 button
- ⑪ PROGRAM button
- ⑫ PLAY button (▶)
- ⑬ PAUSE button (■■)
- ⑭ Track search buttons (TRACK ◀◀, ▶▶)

### DISPLAY

- ① Displays track numbers (01–99) during playback or track search.
- ② Displays index numbers (sub-divisions of tracks); during program input, indicates program steps.
- ③ Displays track playing time and remaining time (minutes).
- ④ Displays track playing time and remaining time (seconds).
- ⑤ Lights during playback.
- ⑥ Lights when peak volume levels on the disc are detected.
- ⑦ Lights during playback pause.
- ⑧ Lights during use of computer allocated program editing or auto program editing.
- ⑨ Lights during auto program editing.
- ⑩ Lights during time fade editing.
- ⑪ Indicates the editing time.
- ⑫ Lights when display is in OFF mode.
- ⑬ Lights during operation of fade function.
- ⑭ Calendar display. Lighted numbers indicate total number of tracks on the disc (during program input and program playback, indicates programmed tracks). When a track completes playback, the corresponding lighted number goes out. Arrow mark [→] lights for tracks higher than "19".
- ⑮ Lights during repeat playback. (During single-track repeat, the [1▶] indicator also lights).
- ⑯ Lights during auto space.
- ⑰ Lights during delete mode.
- ⑱ Lights during program mode.
- ⑲ When "reserve" function is activated, these indicators light in correspondence to the reserved functions (OFF, OPEN, ALL, SINGLE, RND, SCAN).

## 11. SPECIFICATIONS

### 1. General

Type .....	Compact disc digital audio system
Usable discs .....	Compact Disc
Power requirements .....	AC 120V, 60Hz
Power consumption .....	18W
Operating temperature .....	+5°C - +35°C (+41°F - +95°F)
Weight .....	5.0kg (11lb)
External dimensions .....	420(W) x 274(D) x 135(H)mm 16-9 /16(W) x 10-13/16(D) x 5-5/16(H) in.

### 2. Audio section

Frequency response .....	2Hz - 20kHz ±0.5dB
S/N .....	108dB or more (EIAJ)
Dynamic range .....	97dB or more (EIAJ)
Channel separation .....	102dB or more (EIAJ)
Total harmonic distortion .....	0.0022% or less (EIAJ)
Wow and flutter .....	Limit of measurement (±0.001% W.PEAK) or less (EIAJ)
Number of channels .....	2 channels (stereo)

### 3. Output terminal

- Audio line output terminals (FIXED)
- Audio line output terminals (VARIABLE)
- CD-DECK SYNCHRO terminal
- Headphone jack (with motor drive volume control)
- Optical digital output terminal
- Control input/output terminals

### 4. Functions

- Play
- Pause
- Stop
- Auto space
- Manual search
- Track search
- Index search
- Peak search
- Hi-lite scan
- Direct selection

- Single track repeat
- All track repeat
- Programmed repeat
- Delete repeat
- Random play repeat
- Programmed random play repeat
- Delete play repeat random
- Programmed playback (up to 24 tracks)
- Delete playback
- Pause program
- Program check
- Program correction
- Program clear
- Auto program edit
- Compu program edit
- Time fade edit
- Digital level control
- Random play
- Programmed random play
- Delete random play
- Fade in/fade out
- Time location
- Reserve
- Display off
- Program hold
- Level hold
- Timer start
- CD-deck synchro

### 5. Accessories

● Remote control unit .....	1
● Size AAA/R03 dry cell batteries .....	2
● Output cable .....	1
● Control cord .....	1
● Operating instructions .....	1

#### NOTE:

The specifications and design of this product are subject to change without notice, due to improvements.

